MOTOR AGE

Vol. XXXII
No. 13

CHICAGO, SEPTEMBER 27, 1917

Ten cents a copy
Three dollars a year

Greater Profits Now *for* Hudson Dealers

Fifty-one makers have announced advances, but the price of the Hudson Super-Six remains the same. Think what an opportunity for increased sales awaits the Hudson Dealer.

Cars that formerly sold for $200 to $300 less than the Hudson had a price advantage. But even then the sales of no two of them equaled those of the Super-Six. Regardless of price, the Hudson was, and is, the largest selling fine car in the world.

Now that manufacturers of cheaper cars have increased their prices, while Hudson remains the same, Hudson has both a price and quality advantage. Hudsons are more wanted than ever, and Hudson dealers are reaping additional profits from this increased demand.

Hudson dealers have always been prosperous, but this price advantage means even greater prosperity, and the man who is a Hudson dealer today is in a fortunate position.

There are a few communities in the United States where Hudson needs representation, or where its dealers do not come up to the Hudson standard. If you are in business or plan engaging in business where such a condition exists, and see the broad vision and real merchandising opportunity, write us. We might want to know you at any rate for some future need.

HUDSON SUPER SIX

HUDSON MOTOR CAR COMPANY
DETROIT, MICHIGAN

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JOHNSON'S FREEZE-PROOF

Prevents Frozen Radiators

THE only way you can be positively sure that your radiator won't freeze up is to use a non-evaporating anti-freeze preparation. You can never be sure of Alcohol or any other product which evaporates with the water.

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Johnson's Freeze-Proof does not evaporate with the water. One application is sufficient for the whole winter unless the solution is weakened by leakage ot the radiator or hose connections —through the over-flow pipe—or by boiling over.

Economical and Easy

Johnson's Freeze-Proof is the most economical anti-freeze compound on the market. It is very easy to use—simply dissolve in water and pour into the radiator. One package is sufficient to protect a Ford to 5° below zero; for large cars use two packages to protect to 5° below zero, and three packages to protect to 25° below zero.

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Johnson's Freeze-Proof does not injure rubber, cloth, packing or metal of any kind. It does not rust or corrode metal. There is less rust with Johnson's Freeze-Proof than there is with water alone or with a combination of water and alcohol.

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The boiling point of water is 212°. The boiling point of alcohol is 131°. The boiling point of Johnson's Freeze-Proof and water is from 225° to 250° depending upon the amount of Freeze-Proof used.

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ADDRESS.....

CITY AND STATE.....

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.....

.....

Insist upon your dealer supplying you with Johnson's Freeze-Proof. It is readily procurable as practically all jobbers have it in stock. Johnson's Freeze-Proof is put up in packages containing 5 lbs. net which retail at $1.50 each in U. S. A.

If your dealer cannot supply you, we will fill orders direct by prepaid Parcel Post to points in U. S. A. East of the Rockies.

Write for our folder on "Keeping Your Car Young"—it's Free.

S. C. JOHNSON & SON,
Dept. MA RACINE, WIS.

MOTOR AGE

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Among the features of the next issue will be an article by W. F. Bradley, special correspondent with the armies in Europe, on bringing up reserves to the fighting front by motors.

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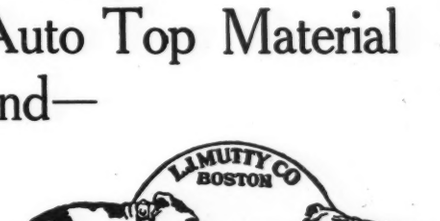

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THE most serious problem confronting business today is shortage of labor. Millions of young men may be called to the colors. Other millions will be needed to produce munitions and material of war. Immigration has stopped. *Many concerns may run short of necessary labor, unless they take steps to protect themselves now.*

Big Business is farsighted. It is installing and utilizing to the utmost every mechanical device which will take the place of horses and men. In delivery service motor trucks do the work.

It is the small business man, manufacturer or merchant who may be caught napping when the "help" crisis comes. If he still employs teams and drivers he may find his business seriously hampered.

The concern which employs two or more vehicles for delivery service may be menacing its future if it does not use trucks.

All business is entering upon a period of war stress and strain. Profits will be lower and volume much higher. The former will be taxed; the latter is always a war time condition. It is so in England; it will be so in this country. The efficiency, speed, steadiness and economy of mechanical power and transportation must supplement or supplant the human factor.

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Wherever efficiency, speed, steadiness and economy are most needed, White Trucks are to be found. Their predominant use by Big Business is well known. Where standardized cost records are kept, White Trucks are purchased increasingly. Their long life, low maintenance and steady operation show unmistakably in figures. The harder the work and the heavier the going, the more marked is this showing.

The White Company has had broad experience in truck installation and in the problems of transport, for big operations and for little operations. Our service and counsel are yours for the asking, without cost or obligation on your part. We never urge an installation which does not promise profit to the owner.

THE WHITE COMPANY, *Cleveland*

When Writing to Advertisers, Please Mention Motor Age

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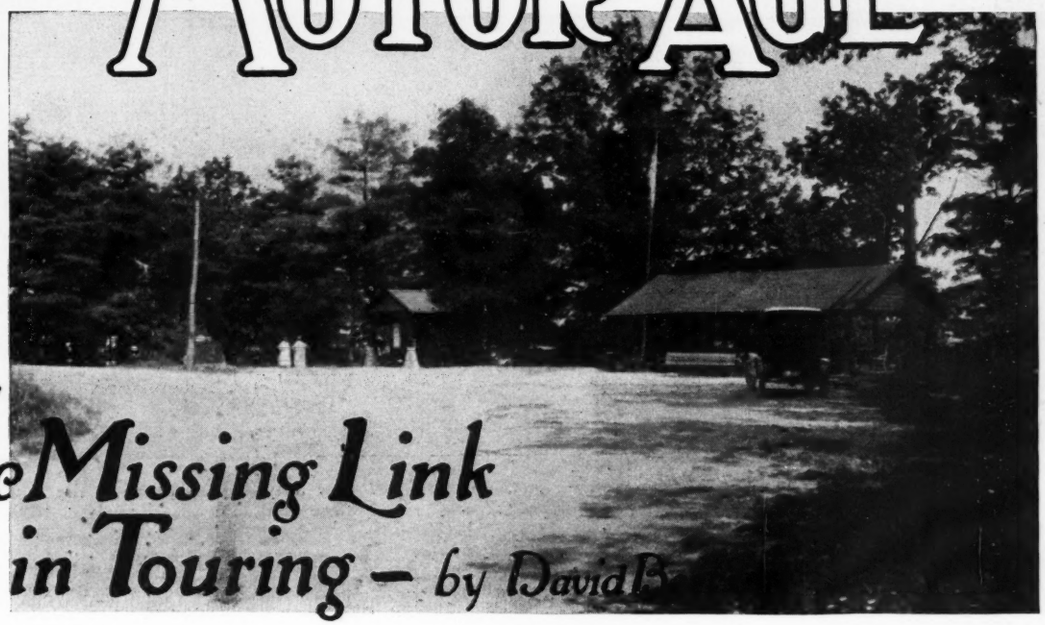
MOTOR AGE



The Missing Link in Touring — by David B.

How a motor club realized this link was missing and forged it with a motor rest park for the tourist

THE city of Owego, located in southern New York State, has added the missing link to touring. It is a Motor Rest—a shady roadside spot on the top of a high bluff overlooking a big horseshoe curve in the Susquehanna river, which flows at the foot of the bluff. In this attractive spot, where you get one of the finest glimpses of New York state landscape with distant hills, broad agricultural valleys and river, modern highway and railroad adding their part to the vista, the Owego Automobile Club forged the missing link in the chain of touring.

Motor Rest is free, with no attendants looking for tips even. It is a park where you stop to take your roadside lunch, drink the afternoon tea from your thermos bottles or, if you have the still stronger roaming nature of the Arab, where you pitch your tent for the night.

Here at Motor Rest you have a large frame dining pavilion, open on all four sides and well supplied with tables on which you can spread your lunch, with seats and chairs to complete the furniture equipment. The pavilion is large enough to accommodate a dozen motor parties, with a separate table for each.

Not far from the dining pavilion is an ice house, a good sized building, perhaps 12 ft. square, which has been well packed with ice by the Owego club. At the side of the house is a small drinking faucet with drain pipe. You do not stop to ask where the water comes from or if good or bad, because you know that any motor club with enough getup and go to undertake furnishing such a motor rest will see to it that the best water is supplied. A few feet from the ice house is a water hydrant with drain pipe and a large pail for supplying the radiators.

Go farther: Next comes the housewife's joy, a stone oven, built from the rough boulders of the countryside and having ovens at each end, so that two parties can cook their noonday eggs and bacon or grill their fish if they are inclined ambitiously. The stone ovens are fitted excellently with everything by way of fire plates and covers, so that the tourist has only to gather the wood from the forest and supply the matches.

Not far from this outdoor cooking oven are several rustic wooden luncheon tables nestled among the trees and commanding one of the finest views of the broad curve of the Susquehanna, a scene that draws to mind the famous horseshoe bend of the Tennessee river at Chattanooga, Tenn. True, the volume of water is smaller and the landscape more restricted but you cannot keep the comparison from edging it-

This sign greets you at the motor rest park, which is on a high bluff, overlooking the Susquehanna on one of the New York state highways

Scores of scenes similar to this one are on the road you follow as you pass through the Finger Lake region between Watkins and Canandaigua

self into your reflections on the scene here.

Near by through the woods of Motor Rest the Owego club has posted conspicuous signs for the tourists drawing their attention to the garbage cans scattered among the trees, which serve as receptacles for waste paper and leftover luncheon debris. The signs are unusual, suggesting that if you have not been brought up to put the waste paper in the garbage cans it is a good time to change your mode of life and start anew. Any motorists with the slightest appreciation of the good the Owego people have done in building Motor Rest cannot refrain from following the advice. There could not be a slacker with such an example to stimulate him.

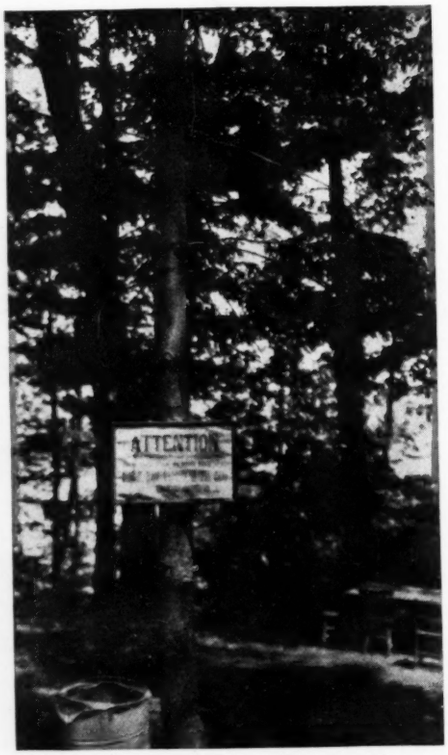
Signs Mark Roads

For miles before you reach Motor Rest roadside signs tell you it is ahead, first 10 miles, then 9, 8, 7, 6 and so on. Each mile your curiosity is whetted. Pictures scurry through your brain, perhaps the foot presses a little harder on the accelerater. You wonder if it is an improvised amusement park, with its peanut stands, merry-go-round and other impositions which the tourist wants to avoid rather than embrace. Finally the last mile is almost counted out by your speedometer and suddenly in the last tenth you approach a broad curve in the road, and here nestled between this curve and the river bluffs a huge sign advises you that this is Motor Rest, that you are cordially invited, in fact, that the rest was built specially for you.

Before you are aware of it you have pulled your car to the side of the road, where there is room for fifty or seventy-five cars. There is the Rest, not an attendant, not a simmering peanut stand, nothing but rest—the real missing link that the tourist has been waiting for unconsciously, but never seemed to have the mental snap to get. Owego did it.

Without further ceremony everybody alights. The ice house alone is a prime attraction. So are the stove, the pavilion, the seats and the tables. Without much ado you select your table, spread out the thermos bottles, sandwiches, cake, etc., and sit down to take in New York state while enjoying the lunch. The eye in one glance surveys the broad curve of the Susquehanna, as well as the entire countryside. No prettier place could be selected in the vicinity. It is also well spaced between the two large cities, Binghamton and Elmira, so that the average tourist leaving either city in the morning will arrive at Motor Rest about lunch time.

The rest is in what is called the Devil's Elbow in the Tioga Narrows near Owego. The land on which the rest is located is leased by the club, and special efforts have been made to make the rest safe as well as beautiful. For situated as it is, overlooking the Susquehanna river, there is a drop of several hundred feet that might prove a serious factor in the gathering of motor tourists there were it not for the strong wire fence that forms an unobtrusive though effective barrier from the cliff. The preparation of the grounds cost quite a sum and plenty of labor, but the club has never regretted either, and certainly the passing motorist has not.



Garbage cans are placed around Motor Rest, and above each is a sign suggesting that if you have never put wastepaper in them before you start doing so now

The idea of a motor rest at this particular spot was conceived by the president of the Owego Automobile Club, George Shays, and was worked out under his active direction. The rest was laid out early in 1916, at which time the pavilion was constructed. Since then the icehouse has been built and water has been piped 600 ft. from a spring of good water on the steep hillside above the park. The water does not come in contact with the ice but runs through the pipes in the middle of the ice and comes from the faucet pure and cold as any trout stream. One faucet is attached to a pipe that comes to the surface near the pavilion; this is where the can for filling the radiators of the cars is placed.

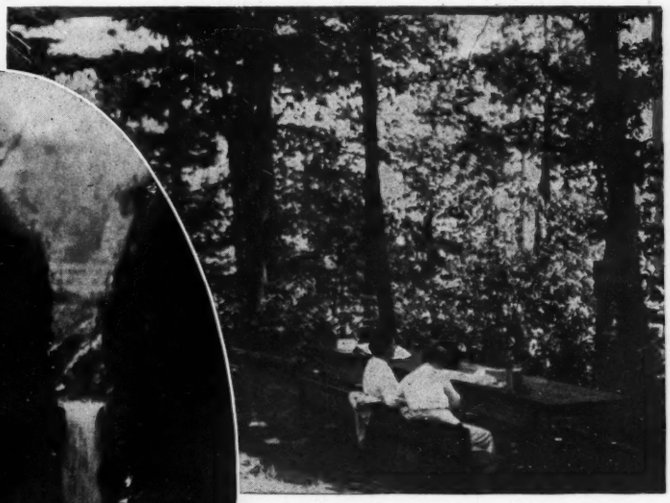
Cost of Equipment

As to the cost of this missing link in touring. The icehouse was about $200, and the piping and labor amounted to $112, which makes a total cost of $312 for the water system. The pavilion cost $138. The expense of tables, chairs and so on cannot be estimated exactly, as much of the equipment was donated by members of the club.

The stone stove was laid out and built by Joel A. Hamilton, a man eighty-four years old. It is made from thirty-two bags of cement and many loads of stone, without a level, plumb or line in all the work.

A brief account of the sponsors show the club to be nine years old. The first president was the Hon. James Truman, who was succeeded by Dr. Sidney Welles Thompson,

The ice house, about 12 ft. square, which is well packed with ice for visiting motorists and through which water runs



Under the trees that overlook the Susquehanna, benches await the motorists' use for their wayside meals

One of the Falls in Watkins Glen, showing the path along the way

also vice-president of the New York State Automobile Association. In 1915, George Shays was elected president, and he, with George H. Hart, vice-president, and Paul H. Beecher, secretary, continue in office now. The club has a membership of more than 400, and each one takes pride in the success of the motor rest. Tourists from Maine to Californi , and from Oregon to Florida have stopped at the rest, and many of them have acknowledged by letter their appreciation of the club's efforts. No donations from other than members of the club have been utilized in the work, and all checks sent by those who enjoy the rest have been returned. The list of names of club members posted on the front of the icehouse is, therefore, a complete list of the sponsors and originators of the rest.

No Tips There

The rest is unusual, as has been suggested already, in that no attendant expects a tip or is allowed to accept one. It is in every way at the disposal of chance motorists. The club has extended an open invitation to every motorist who passes through that section of the state to make use of it. The site was selected with the stranger on the road in mind. The view over the Susquehanna is not a happen-so as you eat your noon-day lunch but one that you are able to enjoy through the foresight exercised in picking the site. Along the valley which you follow in approaching the motor rest General Sullivan made his famous march. It was this valley that James Fenimore Cooper chose to make immortal in fiction. The settlement still bears the old Indian name, and on the sites of the Indian villages through this region still can be found Indian arrow heads, pottery and other relics of a race that fast is disappearing into memory.

Ahwaga once named the settlement which is now Owego. Ahwaga was one of the larger Indian villages. To a certain sense the present name is the old merely changed by passing years. The name was selected by the Indians because of the location—where the valley widens —at the foot of hills. The village was protected from the severe storms of winter and blessed with the shade of many maples in summer, while good fishing added to the joys of Indian life. All these things which pleased the red men can be found to-day, and the members of the Owego Automobile Club have erected this shelter and rest house that visiting motorists may enjoy, temporarily at least, the blessings they have all the time.

Hundreds of motorists do visit the rest and enjoy its hospitality, almost every day during the motoring season. On Sundays in fine weather hundreds of cars will be parked nearby, while the motorists are enjoying an early breakfast, warm dinner or a lighter evening meal. In many cases tourists chose to camp under the pavilion or under the tall and shady trees that surround the park rather than go farther and find a more conventional stopping place. They are encouraged to do this—the more the better from the standpoint of the Owego club. The club has posted more than 4900 road signs and is preparing to post 100 more soon.

That everything may be as pleasant as possible for those who come and go, the club not only has provided this link for the chain of touring but has continued its good work by doing all it can to prevent any mar of the surface of the pleasures derived from coming upon this oasis, so to speak, in the road. The club does not say "watch your parcels and umbrellas" and shirk all respons bility of hunting for lost articles. If it did its present fine record would not be possible. Almost every day valuables that have been left at the rest by tourists are brought to headquarters. In every instance the owners have been found and their property has been restored. One case is typical. A small hand bag was found at the rest. It contained no mark of identification other than the name

Climbing a long rise before reaching Monticello when coming west. A wonderful panorama meets the eye of the motor tourist

A stretch of New York state road, looking down the long drop into Pennyan on the north end of Keuka lake

Rolling country a few miles west of Binghamton; the river is to the left of a road that dips from hilltop to river

of the owner, which did not include the address, but the club started out to locate the owner. The bag was advertised in the newspapers and elsewhere, and finally the owner was located at Springfield, Mass., hundreds of miles from where the bag was lost.

On the Main Highway

Motor Rest is on the main highway between New York and Buffalo which crosses the southern counties of the state. The road leaving New York crosses the Hudson and after going up through the Tuxedo Park country past Suffern and Middleton, climbs the offshoots of the Catskills at Monticello and Liberty in the heart of that attractive summer country where every big farm home is a summer boarding house accommodating from twenty to fifty, made up of family groups from the city. From Liberty the route lies through Binghamton, then Owego, Elmira and thence to Watkins in the heart of the justly famed Finger Lake country of New York state.

From Liberty to Binghamton and beyond Owego the trip is one of the finest in Southern New York and is preferable to the Mohawk Valley trip from Rochester through Utica, Syracuse and Albany. The road follows the Delaware river for 60 miles before reaching Binghamton. These miles make one of the finest winding roller coaster rides in the state of the black dustless state roads. The road seems to be a continuous undulation, with descents down which the car gains enough momentum to carry it almost imperceptibly up the following inclines. You almost escape the incline until you speed up and look over your shoulder to discover that you are two-thirds up a long rise. The entire distance is this up-and-down going with the sunset at your back if you are headed eastward and in your eyes if headed westward.

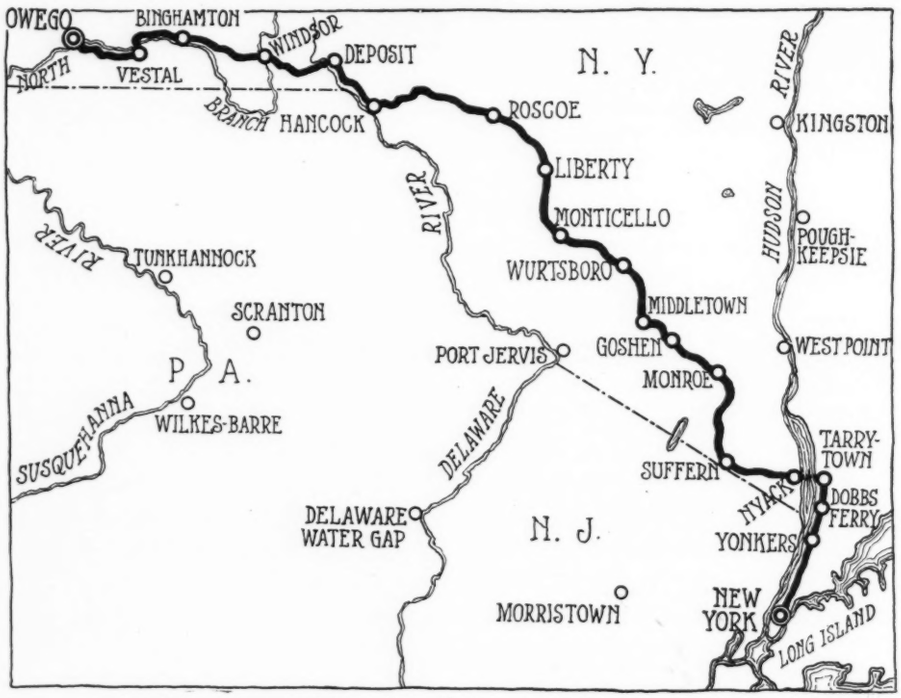
At one time you are on the top of the world, so you feel, with the winding river and its traveling companion, the railroad, far beneath. Then without warning you start dipping. You often cut out the ignition and coast for upwards of a mile, perhaps more, before the road is almost at water level, with only a cement wall separating road and stream. You may follow the stream for a mile, perhaps two, and then the road shoots off up a hill, away from the water, and you are going up and up, only to arrive suddenly once more at the top of the landscape. Then follows another descent. So it is for mile after mile. You congratulate the Empire state for having built such a wonderful road in which you start with your hands and face clean and your clothes free from dust and at the night hotel you can go into the dining room without washing.

Just before reaching Binghamton you leave the Delaware and take up with the Susquehanna and follow its waters nearly to Elmira, where the valley you have followed for over 100 miles spreads out into the finest agricultural land that ever gladdened the heart of man. It is a rolling land dotted with cultivated farms, spread over the rolling hills and interspersed with clumps of trees. This country continues to Watkins, at the lower end of Lake Seneca, one of the Finger lakes, which lies nestled in its valley with Lake Cayuga in another valley farther East and Lake Keuka in its valley a little to the West. Ithaca, the seat of Cornell University, Watkins with its justly celebrated glen and hotel and Hammondsport with its hydroairplane depot occupy corresponding locations at the lower ends of the three lakes.

Fine Farming Land

Between these lakes the finest farming land of the state is found. The land rises high above the lakes, calling generally for a 2-mile climb from the water edge to the top of the rise, from which you look back over the valley and see the lake stretching for several miles and the wonderful farming land rising to meet the sky on the opposite side.

You pass through Penn Yan at the north end of Lake Keuka and then head for Canandaigua at the head of a lake of the same name. Here you bid adieu to the Finger Lake country and start over the



Map of route from New York on which you come to the Owega club's motor rest, the missing link in touring

rolling roads toward Buffalo. Gradually as you get into the zone of Lake Erie and Lake Ontario the hills flatten and soon you are traveling over long level stretches of New York highways which lead to Buffalo and Niagara Falls.

TO MAP TEXAS HIGHWAYS

Dallas, Tex., Sept. 21—The Dallas Automobile Club is having the roads of the state mapped with a view to gathering all the available touring data in the state. The club will cover about 8000 miles. Road maps and lists of the garages and hotels along the roads will be made. The roads of interest to motorists who cross the country which will be mapped are:

Denver, Col., to the Gulf via Colorado Springs, Raton, N. M.; Amarillo, Wichita Falls, Fort Worth, Dallas, Waco, where the road branches, going to Marlin, Bryan, Houston and Galveston, and the other route via Temple, Austin, San Marcos, San Antonio to Corpus Christi; San Marcos to Houston via Lockhart and La Grange; Kansas City to the Gulf via Oklahoma, which will be the same as the Denver-to-the-Gulf route from Dallas south; Memphis, Tenn., to El Paso via Little Rock, Hot Springs, Texarkana, Greenville, Dallas, Fort Worth, Mineral Wells, Abilene, Sweetwater; Dallas to New Orleans via Tyler, Longview, Marshall, Shreveport and via Waco, Houston, Beaumont, Orange and Lake Charles.

How a Ford Owner Dressed Up His Car

THIS week while the National Exposition for Ford Accessories is the central attraction for Ford owners in the Middle West, it is apropos that this story be printed. Almost everyone knows that when he buys a Ford he does not get any more accessories than he needs and those who have not dressed up their steeds will find out this week just what they should have if they visit the accessory show. At least one individual has been found who needs no exposition to teach him what he can put on his Ford. He is a customer of the Motor Car Supply Co., Calgary, Alta., and the company asks that his name be withheld.

However, the gentleman in question purchased a Ford in Calgary for $555. Immediately he found some things lacking that some of the other cars had as equipment and he proceeded to doll up his car with everything he could find. Here is what he has put on the car and the price he paid in Calgary:

Electric starter	$130.00
Carbureter—Stromberg	22.50
Seat covers	32.00
One-man top	37.00
High-tension magneto—Eisemann	70.00
Bailey non-stall differential	22.50
Leak-proof piston rings	8.00
Eight special grease cups—Edelman	1.60
Accelerator—Apco	.90
Electric tail lamps—Victor	1.50
Electric side lamps—Victor	6.00
Klaxon horn	4.00
More Room steering wheel—Neville	9.00
Special steering wheel horn button—Handy	.60
Waltham 8-day clock	8.00
Ammeter—Willard	8.00
Dashboard switches—Cutler—Hammer 4 gang	4.00
Speedometer—Stewart	13.00

The cooking oven at motor rest—erected by the Owego Automobile Club. There is an oven at each end of the structure

Motor Rest park is in a turn of the state highway known as the Devil's Elbow and is located overlooking the Susquehanna

Dash and trouble lamp—Presto	2.75
Cigar lighter and reel—Presto	6.00
Instrument board—Johnston	2.00
Aluminum running boards	6.00
Tool box—Victor	3.25
Robe rail—Style X	.75
Rear view mirror	3.00
Windshield cleaner	2.00
Cork insert trans. bands	4.00
Steerezer	3.75
Moto-Meter	5.00
Radiator cap—Edlemann	.50
Oil can holder	.30
Starting handle and holder	.25
Shock absorbers	15.00
Radius supports—L. H. K	2.50
Cut-out—Gemco	1.50
Dem. wheels—Kelsey	32.00
Spare rim and tire	23.00
Tire carrier—Gemco	5.00
Non-skid tires—Dominion extra price	13.30
Exhaust deflector—Victor	.25
Gasoline gage—Gem	2.00
Oil gage—Edlemann	.40
Warner Lenz	4.50
Pedal pads	.75
Alweather protector—Car Cool	2.25
Electric heater	3.50
Door pads	1.00
Trojan roller bearings	18.00
	$543.10

In addition to this he carries in his tool box as equipment the following, which cost him:

Pull-U-Out	$18.25
Special jack	3.50
Special pump	7.00
Socket wrench set	8.00
Wood chains	5.00
	$ 41.75
Accessories billed to car	543.10
Total	$584.85

In addition to all this the company is figuring on furnishing him with an all weather top for the coming winter.

FORD BRANCH AN ARMY BASE

Detroit, Sept. 22—Henry Ford has agreed to turn over for the use of the Quartermaster's Department his factory and assembly plant at Cambridge, Mass. The offer followed the failure of the Department to find another building or site suitable for so large a supply depot as is necessary. The floor space available in the factory is about 350,000 sq. ft. The question of rent has been left to the future, and Mr. Ford has offered to vacate the plant by Oct. 15 to give immediate possession to the Quartermaster-General.

Are Cars in Cosmetic Class?

To Tax or Not to Tax Still a Debatable Question in Congress

WASHINGTON, Sept. 24—Whether the motor car will be classed with fiddles and talking machines, as well as face powder and other articles that might be similarly classed, will not be determined for a few days yet. The Conference Committee, which has the war tax matter in hand still is debating on placing a manufacturers' tax on these. The motor car, it appears, may have a 3 per cent tax levied on the wholesale price as sold by the manufacturer to the dealer or distributor. Chairman Claude Kitchin of the Ways and Means Committee of the House is determined that the motor car must pay this tax. He is making a tremendous fight and trying to dominate not only his own committee but the Conference Committee of the House and Senate. Up to this time there has been a good division in the Conference Committee.

Kitchin's Conviction

The root of the 3 per cent tax which Chairman Kitchin seems determined to enforce apparently rests with his conviction that the motor car is a luxury, and one would apparently not be wrong in inferring that Chairman Kitchin would not be disappointed, but in fact pleased, if the entire manufacture of passenger motor cars were stopped. He apparently considers the motor car solely as a luxury, and he seems to be entirely honest with himself in this view.

Fortunately the motor car industry scattered all over the country is waging a great campaign of education with members of the Senate, members of the House and the three committees that have the matter in hand, namely, the Ways and Means Committee of the House, the Finance Committee of the Senate and the Conference Committee, which is made up of members from the House and Senate. The personnel of all is published herewith.

It is the injustice of the tax that has roused such indignation on the part of motor car manufacturers, dealers and owners. There is no reason why the motor car should be singled out and taxed when the pleasure motor boat is not. The horse carriage is not taxed. The bicycle is not taxed. The passenger steamboat is not taxed. For some unknown reason the motor car has been singled out and classed with talking machines, cosmetics, etc., which are to be taxed similarly.

It is unfortunate that such men as Chairman Kitchin cannot see that the motor car is more today than a luxury. It is impossible to understand how he can be so ignorant of the role played by the motor car today. It is granted that a percentage of the use of the motor car is a luxury, but when it is remembered that nearly 70 per cent of the machines are owned by farmers and that these farmers are using them as utility machines, the luxury argument disappears. Fortunately many senators and congressmen know of the utility use of the motor car not only with farmers but with hundreds of thousands of business people. This is attested to by the fact that one congressman admitted having received over 600 telegrams from motor car people in his district protesting against the unfairness and the discrimination of the tax.

It has been suggested by the Conference Committee, and Mr. Kitchin has shared in the suggestion, that the motor car manufacturer pass this tax on to the ultimate buyer of the car. The scheme apparently would work out as follows: The manufacturer would bill the dealer or distributor at the regular price and add 3 per cent war tax in addition. The dealer then would have to pass this on to the buyer or take it out of his trade discount. It seems that the dealer is the goat. He either will have to pay it himself or increase the price of the car to his buyers. The manufacturer, however, is made responsible for the collection of the tax as he will have to pay the Government.

Something Definite Soon

Something definite as to final action on the report will be expected in a day or so. If the Conference Committee brings in a unanimous report favoring the 3 per cent tax, it is certain to become a law. It is more than possible that there will be a division in the report, which means the matter will be referred back to the Senate and probably to the House. In this case it will be a week or ten days before any definite settlement has been arrived at. In the meantime motor car manufacturers, dealers, distributors and owners are urged to wire their congressmen and senators. They also are urged to wire the members of the Ways and Means Committee of the House, members of the Senate Finance Committee and members of the Conference Committee. For convenience the names of the members of the last three committees are given herewith.

The Men of Car Tax Committees

Congressmen to Whom Telegrams on Proposed Levy Should Be Sent

WAYS AND MEANS COMMITTEE, HOUSE OFFICE BUILDING, WASHINGTON, D. C.

Claude Kitchin, of North Carolina.
Henry T. Rainey, of Illinois.
Lincoln Dixon, of Indiana.
Cordell Hull, of Tennessee.
John N. Gardner, of Texas.
James W. Collier, of Mississippi.
Clement C. Dickinson, of Missouri.
Michael F. Conry, of New York.
William A. Oldfield, of Arkansas.
Daniel J. McGillicuddy, of Maine.
Alfred G. Allen, of Ohio.
Charles R. Crisp, of Georgia.
John J. Casey, of Pennsylvania.
Guy T. Helvering, of Kansas.
Joseph W. Fordney, of Michigan.
Augustus P. Gardner, of Massachusetts.
J. Hampton Moore, of Pennsylvania.
William R. Green, of Iowa.
Charles H. Sloan, of Nebraska.
Ebenezer J. Hill, of Connecticut.
Nicholas Longworth, of Ohio.
George W. Fairchild, of New York.

SENATE FINANCE COMMITTEE, SENATE OFFICE BUILDING, WASHINGTON, D. C.

F. M. Simmons, of North Carolina.
William J. Stone, of Missouri.
John Sharp Williams, of Mississippi.
Charles F. Johnson, of Maine.
Hoke Smith, of Georgia.
Charles S. Thomas, of Colorado.
Ollie M. James, of Kentucky.
William Hughes, of New Jersey.
Thomas P. Gore, of Oklahoma.
John W. Kern, of Indiana.
Boies Penrose, of Pennsylvania.
Henry Cabot Lodge, of Massachusetts.
Porter J. McCumber, of North Dakota.
Reed Smoot, of Utah.
Jacob H. Gallinger, of New Hampshire.
Clarence D. Clark, of Wyoming.
Robert M. LaFollette, of Wisconsin.

CONFERENCE COMMITTEE, WHITE HOUSE, WASHINGTON, D. C.

Senate.

S. M. Simmons, of North Carolina.
William J. Stone, of Missouri.
John Sharp Williams, of Mississippi.
Boies Penrose, of Pennsylvania.
Henry Cabot Lodge, of Massachusetts.

House.

Claude Kitchin, of North Carolina.
Lincoln Dixon, of Indiana.
Henry T. Rainey, of Illinois.
J. Hampton Moore, of Pennsylvania.
Joseph W. Fordney, of Michigan.

Plane to Cross Atlantic?

Flight by Airplane from London to New York to Be Attempted

Aerial Travel to Paris Down to Time Schedule

WASHINGTON, Sept. 24—Almost coincident with the flight of a student at the Hampstead Plain, L. I., aviation school in which a new American record for altitude was established, there arises the probability of a proposed flight by airplane from London to New York. J. A. Whitehead, governing director of the Whitehead Aircraft, Ltd., is the originator of the scheme, which, it seems, leads on to more talk as to what the airplane can do and what it will do before war development ceases with peace.

The airplane flight from London to New York has been outlined to such an extent that the name of the aviator even has been announced. This is Herbert Sykes, who, according to Mr. Whitehead's interview in the Daily Sketch, expects to leave Hanworth Park, Feltham, Middlesex, at dawn and reach New York before night. The machine for the trip will be a special design of a very powerful Whitehead machine which is being built now. Edgar Middleton, who has served in an English regiment, will accompany Sykes.

London to Paris

Already airplane travel between London and Paris has been reduced to a matter of routine—on paper if not in practice. The cost has been worked out in detail and is estimated at $1 a mile for operation of one machine each way daily in carrying 2,500 lb., less gasoline, oil and pilot. The cost of an airplane is put at $12,000. This estimate is considered low, as a passenger plane would be higher probably, and a fair rate of expense would be nearer $1.25 a mile, according to airplane authorities.

Profit and loss account for this London-Paris travel is figured at $215,000 profit a year with four machines in operation, provided twelve passengers at $25 each travel each trip. Mail at a half-penny an ounce is expected to bring a profit of $450,000 a year. So far the cost of aerial transit is computed at much more than by rail. Whether the advantages of commercial aerial traffic, speed, for instance, will outweigh the actual cost is yet to be decided.

In the flight at Hempstead Plains Caleb Bragg, an aviator there, flew 21,800 ft., by rough register. His barograph showed an altitude of 22,000 ft. The world's professional record is held by H. F. Hawker, who ascended 24,408 ft. at Brooklands, England, April 28, 1916. A German aviator claims an ascent of 26,263 ft. in 1914. Bragg's flight required 1½ hr. in the ascent, and he came down in long spirals in 30 min. He used a Wright-Martin biplane with a 160-hp. engine.

Plans are under way to organize yet another airplane company, this time the Grand Rapids Aeronautic Motors Co. Designs for the engines made under the Field patents are being completed in Detroit, and the plan is to have 100 men subscribe $100 each to the company which will be organized.

The Falls Motors Corp., Sheboygan Falls, Wis., has taken a large order for engines and parts for the Curtiss Airplane Corp., the initial order for which calls for 5,000 engines. The Curtiss company will build a one-story brick factory to cost $500,000 in addition to its present plants. Curtiss has with it now one of the Hudson racing team, Billy Chandler, who is inspecting airplane engines.

LINCOLN PLANT IS BEGUN

Detroit, Sept. 24—Work was started Saturday on the large factory which will be erected by the Lincoln Motor Co., headed by Henry M. Leland, formerly president of the Cadillac Motor Car Co. A 50-acre site has been purchased and approximately $5,000,000 will be invested. The first excavations by steam shovel have been commenced and it is expected that the plant will be producing the new Liberty airplane engines within three months.

Plans for the new buildings were prepared by Walbridge-Aldinger Co., engineer and builder, and special transportation facilities have been provided to rush materials and equipment to this city. The business is being launched on a permanent basis and will undoubtedly be the biggest of its kind in this country. It is reported that one of the Liberty engines in a recent test in New York reached to a height of 20,000 ft., where the engine was stopped and the plane glided for 30 miles to Mineola, L. I., during which time it had only dropped to a height of 10,000 ft.

BIG ORDER FOR AIRPLANE TOOLS

Detroit, Sept. 24—The United States Government has placed orders for 1000 machine tools costing $3,000,000 to be installed in manufacturing plants that will build Liberty airplane engines, according to reports from Washington.

CAR PRICES INCREASE

Chicago, Sept. 25—Packard, Winton, F. R. P., Jones, Pennsy and Moon have gone up in price, as follows:

CAR	OLD PRICE	NEW PRICE
Packard 3-25	$3,450	$3,700
Packard 3-35	3,850	4,100
F. R. P.	6,000	7,000
Jones 26-B	1,475	1,675
Marmon 34	3,050	3,550
Moon	1,000	1,095
Moon 6-45	1,395	1,575
Moon 6-66	1,750	1,850
Winton 33*	2,685	2,950

*Five-passenger touring, effective Oct. 15—$265 increase on other styles of that model also.

FORD INCREASE $26,754,520

Detroit, Sept. 25—Special telegram—The Ford Motor Co. in its financial statement shows an increase of $26,754,520 for fiscal year ended July 31, as compared with a year ago and reducing $7,420,381 in amount of cash on hand in banks as compared with a year ago. The statement also shows a large increase in the value of the inventory of goods and merchandise. Statement includes assets of $158,834,778.99 and liabilities of $25,259,871.14.

Ford Australian Plant

Body-Building Factory Follows Import Ban—Cars Arrive Knocked-Down

Country Unequipped for Production and Material Is High

MELBOURNE, Australia, Sept. 1—Within 24 hrs. after it was announced on Aug. 10 that the importation of bodies for motor cars into Australia was prohibited the Ford company had planned to build all bodies for its Australian trade in this country and started a factory in Melbourne with 30,000 sq. ft. of floor space. The company also placed orders with the local Dunlop company for 5,000 sets of tires and tubes. Ford cars arrive in Australia in knock-down condition and are assembled here.

The cost of building bodies here now is expensive due to the shortage of skilled labor and the scarcity of necessary materials. Cheap metals for body panels is now quoted at $367 a ton and are difficult to procure. Ash for body sills is expensive, and there is a shortage in supplies of paints and leads. Because of this it is estimated that under present conditions Australia cannot furnish more than 30 per cent of the bodies required for the chassis that can be sold.

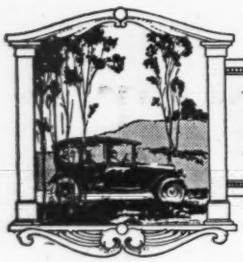
Although Australia has well-equipped body-building factories none has installed machinery for the quantity production that will be necessary because of the embargo. Today a four-seated body costs approximately $690 to procure, as these companies previously have confined their manufacturing efforts to customers who desired special features in their bodies and asked that individuality be injected into the design.

The value of motor car bodies imported during the last fiscal year was $1,535,000, the duties on bodies imported from America being as follows: Single-seater, $85; two-seater, $120; and bodies with canopy tops, $210.

The general opinion in Australia today is that the embargo will be continued after the war. Local body builders are making urgent demands that this be done as it would justify their building and equipping factories capable of producing bodies in quantity.

KELSEY GETS FORD ORDER

Detroit, Sept. 25—Special telegram—The Kelsey Wheel Co. has been awarded a contract for manufacturing wheels for 7000 Ford tractors to be shipped to England. The order is a hurried one and the Kelsey company, already rushed with business, is making arrangements with Detroit and Ecorse Foundry Co., Wyandotte, Mich., to handle order. It is reported that the Kelsey company will erect a large building adjoining the Ecorse foundry and will provide patterns and equipment and that the Ecorse foundry will furnish the raw material and do the work.



EDITORIAL PERSPECTIVES

Fuel Economy and the Engine

THERE is a phase of the fuel economy propaganda that has not received a great deal of attention, but it is a feature which is well worth the study of the motorist. This is the fact that if all of the fuel which goes into the manifold is completely burned it will result in a direct monetary saving to the owner, aside from the simple reduction in the quantity of gasoline required. Gasoline vapor that is not completely consumed in the engine does one of three things; it either passes out into the exhaust in an unburned state and is wasted, is deposited in the form of carbon within the cylinder, or condenses and runs down past pistons into the crankcase.

THE first of these is the most direct loss, but the other two are equally important in the long run. A carbonized motor is of itself inefficient. Carbon makes the engine miss, makes it overheat and pre-ignite. All of these things are sure to shorten the life of the engine. When the unburned fuel runs down past the piston it destroys the seal between piston rings and cylinder, removes the oil which is to protect the surface of the cylinder and piston from friction and wear and, lastly, dilutes the lubricating oil in the crankcase to such an extent that in time it becomes worthless.

MANUFACTURERS are advising now that the crankcase be drained even more frequently than ever before for this very reason. As cold weather approaches, the necessity for freguently refilling completely with new oil will become more imperative. Either the motorist is forced to drain out his oil and refill with fresh at an increased outlay or he must suffer the consequences of an engine damaged by insufficient lubrication.

PREVALENCE in some sections of gasoline adulteration is so great that some of the Detroit manufacturers are advising their dealers to notify their owners telling them to use extra care to keep their motors free from carbon and warning them to be painstaking in the purchase of high-grade fuel, and also to be religious in their observance of the rule to drain their crankcases frequently. Some of the tests in Detroit are said to have revealed as high as 50 per cent of kerosene in the fuel that is being bought as gasoline.

Popular Racing

PERHAPS the present war will bring motor car racing down to a rock basis which will prove that there is still great interest among the public for motor racing providing they can see it for something less than $8 per seat and providing the races are not so long and the field so large that nobody, experts not included, can follow the progress of the race and leaders in it.

THERE were several different angles of interest in the Saturday racing program on the Sheepshead Bay Speedway. First, the 100-mile race for the Harkness Trophy was not an interesting event because there was little mental problem in it. Interest is always founded on a mental problem. The problem must be in the minds of all the spectators. There was no mental problem because Chevrolet and de Palma ran away from the rest of the field, and so far as the race was concerned it became a kind of trailing one between these two. The grandstands sat quiet throughout the race. There was some hand-clapping, but no thrilling applause.

THE thrilling applause came in the sprint program when there were handicap events and when the two fast racers, de Palma and Chevrolet, were scratch starters. When these races were on the grandstands were on their feet. There was shouting. There was cheering. There was great interest. Here again the interest was on the mental problem in the mind of each. The question was, Could the scratch starters overtake the field? From the start to the finish each grandstand spectator was attempting to solve a mathematical problem. It was a question of division involving the problems of time, speed and distance. All of the spectators worked continuously to solve the problem from the start to the finish of the race. They were so interested in their own mental activity that they could not remain seated. They were so enthusiastic they had to shout. Stale hand-clapping would not satisfy their mental thirst. They had to stand up and cheer.

SUCH is successful racing. Racing where there is a real matching of ability. Not a procession made up of thirty racers of widely varying caliber.

Uniform License Numbers

UNWIELDY license numbers in some states have caused comment in these columns before. The suggestion in the letter below that the alphabet be used in conjunction with numerals is a good one and would go a long way toward reducing the number of characters on a number plate. The use of one series of letters in conjunction with numbers is not uncommon, but the arrangement suggested by Mr. Kelly, president of the Martin V. Kelley Co., in a letter to the Secretary of State of Ohio is original, so far as we know, and certainly is worthy of consideration.

IN introducing his idea, Mr. Kelly states a fact that is recognized generally, that is, that the number of cars in many of the states has become so large that the present methods of license-numbering make a license plate unwieldy for attachment and moreover, there are so many figures that it is impossible for an officer or any one else to make a hasty note of the number of the car. His suggestions follow:

"Why would it not be a good scheme to start using numbers and letters instead of all figures? For instance, you could say Number A-52, A-53, A-54, etc., from one to ninety-nine, then you could reverse it and make it 52-A, 53-A, 54-A, etc., from one to ninety-nine; then the next change could be 5A2, 5A3, 5A4, etc., to ninety-nine; and thus by mixing the alphabet with the numerals you could get up a series of number plates on which it would be necessary for only three, or at the most four, large-sized figures to be shown."

Conservation of Man Power

Motor Cars and Trucks Work Economy for Merchant and Farmer in Labor

NEVER before in the world's history has such a responsibility rested upon any one class of people as that which now rests upon the farmers of the United States. The acres in their keeping—and these acres alone—can furnish the ammunition of food which is to decide the future of civilization. Already this army of acres has been mobilized and is drilling through tilling to make up for the most serious food shortage humanity ever has faced.

These facts make it imperative that every ounce of man power be conserved that our acres may produce the necessities for our army and our civilians. It is true that the decision in this struggle against the foes of freedom is to be wrought out on the fertile fields of our own land rather than fought out on the fields of Flanders. Thousands of our men have gone and are going into training. These must be fed, together with those going to France. We must find something to take the place of the men who have been called and to help those who have not been called fill the places of those who are gone.

Motor vehicles are destined to play an important part in helping to relieve the problems of labor shortage brought about by the war. The call for men in the war has resulted in the enlisting and drafting of many men who drove delivery wagons and did other kinds of teaming. As a natural consequence merchants and business men—in this latter class are the farmers, for who can deny that the modern farmer is a business man?—are being forced to make use of some method of hauling that will enable one man to do the work of two and sometimes more. One truck may perform the work of three horse-drawn wagons and thus one man can take the place of three, releasing two for military or other service.

This condition is not peculiar to the city alone. In the smaller towns and to just as great an extent on the farms, the same holds true. With farm labor scarce and high priced the ability of a truck to release two men for military or farm service is a considerable item, particularly when it is considered that at the same time in each case twenty-five acres of land are released for the production of food for humans.

It requires five acres of tillable land to support a horse; three acres to support a man, each year. If each motor car took the place of only one span of horses, the 4,000,000 odd motor vehicles release 40,000,000 acres of land for the production of food for more than 12,000,000 men—the total force now employed by the allies.

Almost every branch of industry and agriculture is crying for more men. If the calling of three-quarters of a million men from their occupations in a country of over 100,000,000 population brings such an intense cry, what will that cry be if we are called upon to furnish not a half million, but five or perhaps ten million? Now is the time when we should look to a solution of the problem, and we know of no better place to begin than by motorizing every movement where it is feasible. The country might as well prepare now for future labor shortage. If that shortage does not come, well and good, but be ready. It does not take a far-seeing man to understand that motor trucks and motor cars make possible an amount of work being done by one man and a truck double, triple, yes, in many instances quadruple that of a man and team.

Concrete instances of these possibilities might be given but they would mean little as a whole. Pages might be written of examples in saving accomplished by trucks and motor vehicles as compared with horses. It is enough that these things can be done. It is the patriotic duty of every employer of men to conserve their power in every way possible. Use motor vehicles and use them now.

U. S. Truck Delivery Expected in January

WASHINGTON, Sept. 22—In an interview given out today by Secretary of War Baker, he announced that a sample chassis of the new standard military truck will be ready for final tests by the middle of October and that deliveries are expected to begin in January, within four months after the War Department undertook the development of the trucks. In making his statements as to the completion of the design of the truck which will meet the field transportation problems of the war, Mr. Baker said:

How Work Was Done

"After a series of conferences between military and civilian engineers the design of the standard truck was completed early in September. Within ten days detailed drawings were made and sample parts ordered. Ordinarily it requires several months to perfect and turn out such parts, but various manufacturers patriotically agreed to put ahead the Government's work and delivery of the parts, it is now expected, will be made by Oct. 1. The crankshaft die was sunk in seven days, and the crankcase pattern and first casting were made five days after receipt of the drawings.

"It is believed the new standard motor truck will fully meet the requirements of the army in the field. Rapidity of manufacture, stability, and standardization are the outstanding promises of the new truck.

"While the designing of the military truck lacked the dramatic features of the development of the United States aviation engine or liberty motor, it was brought about by similarly systematic and speedy methods. In the conduct of the war it is essential that we shall have large numbers of airplanes; it is also essential that transportation on land shall be highly developed. The designing of an acceptable truck is a distinct achievement.

"In July the Quartermaster Corps initiated the movement for the production of a standardized military truck that would be an improvement over commercial designs heretofore used. Coöperation of truck manufacturers in all parts of the country was promised at a meeting held in Columbus in July. Early in August about fifty truck specialists and engineers of established reputation came to Washington at the invitation of the Quartermaster Corps. The Society of Automotive Engineers, which is assisting the Government, on engineering problems, also sponsored the Washington conferences.

"The new military truck will be made in two-models, class A and class B. The engine used in the two will be the same in design, except for slight differences in cylinder bore, pistons, piston parts, and riggings. To a large degree interchangeability of parts will be possible. The class A model will have a normal carrying capacity, under the arbitrary official ruling, of 1½ tons, with an actual commercial capacity of 3 tons. The class B truck will have a normal capacity of 3 tons and an actual capacity of 5 tons. Both trucks will have a two-wheel drive, with a speed requirement of 14 miles per hour for the class A trucks and 12 miles for class B trucks.

10,000 in First Order

"It is planned that the first orders for the trucks shall call for 10,000 vehicles, to be delivered in the first six months of 1918. These orders will call for 10,000 class B and 5,000 class A trucks. The adaptability of the new trucks to commercial as well as military uses is indicated by arrangements now being made by a number of manufacturers to produce them or commercial purposes."

Economy to Insure Gasoline

Bedford Says Oil Is Plentiful—Men, Money and Fuel Thrift Necessary

ATLANTIC CITY, N. J., Sept. 21—"The situation with regard to gasoline in the United States, while not serious, is such as to call for very grave consideration. There is plenty of crude oil in the bowels of the earth, but more men are needed to drill wells in order to increase the supply. Increasing the supply of crude oil is the biggest problem facing the gasoline industry to date. We have enough gasoline to insure the allies having all necessary fuel to carry on the war, and there should be enough remaining for home requirements, but careful conservation is necessary."

In these words A. C. Bedford of New York, president of the Standard Oil Co., summed up the gasoline situation in his address before 1500 delegates attending the war convention of the Chamber of Commerce of the United States in session in this city this week. Mr. Bedford said that the price of crude is certain to go higher than $2 a barrel, at which it is selling at present, due to the greatly increased price of steel needed for storage tanks and also to the increased cost of labor. In 1915 crude sold for 40 cents a barrel; in 1917 it jumped to $1.70; and in August of this year to $2 a barrel.

There are 25,000 different organizations producing crude, but yet the amount of new crude produced this year in comparison to supply is not so great as it was a year ago. Today the annual supply of crude is 312,000,000 bbl., but the demand is 333,000,000 bbl., so that demand is 18,000,000 bbl. greater than supply. At the present time there is no shortage of refineries to handle much more crude than is needed; in fact, the capacity of the refineries is 350,000,000 gal. per year. Mr. Bedford paid a fitting tribute to Dr. William Burton, chief chemist of the Standard Oil Co. of Indiana, who invented the cracking process, when he declared that had it not been for Doctor Burton's invention and the general use of it there would not be enough gasoline today to meet the requirements.

The production of casing head gasoline is helping out very materially. Approximately 2,500,000 bbl. will be produced from this source this year, and next year perhaps 6,500,000 bbl. will come from this same source. The present stock of crude oil on hand is being slowly cut into. Jan. 1 this year the stock of crude in storage was 174,000,000 bbl., and on July 1 it had shrunk to 164,000,000 bbl.

Some conception of the increased demands being made on the supply of gasoline is apparent from the production figures covering the last dozen years.

In 1899 production was 6,000,000 bbl.; 1916 production was 45,000,000 bbl.; 1917 production 50,000,000 bbl. Notwithstanding the greater home demands on the crude supply and also for gasoline, the United States will give the allies all the gasoline and crude that are needed for the successful carrying on of the war. In 1915 over 5,000,000 bbl. of gasoline were exported to them. In 1917 our exports will total over 7,000,000 bbl., and during the next twelve months we will export over 8,000,000 bbl.

Mr. Bedford believes it will not be necessary for the Government to step in and take control of the gasoline industry unless runaway prices set in, in which case there would be no other course left open for the Government. He did not see any possible reason for such prices but foresaw a gradual increase in price due to the higher price of crude, higher labor and higher material prices.

One difficulty connected with the crude oil industry as compared with the metal industry is that it is impossible to gage accurately the capacity of any oil well the same as the amount of ore in an iron mine can be computed. The crude oil prospector is never certain of his property, as witness the case of the Cushing pool in Oklahoma, which produced 320,000 bbl. a day but in a short time dropped to 112,000 and is now at 20,000. The condition brought about by this group of wells entirely upset the crude oil field a few years ago.

Mr. Bedford urged economy in the use of motor cars but saw no reason for any general restriction in their use. He contended that car owners should at once start to differentiate between the necessary legitimate use of the car and what might be termed the luxury use. Present conditions demand no necessity for limiting the utilitarian use of the car.

He declared that the petroleum interests had pledged their undivided loyalty to the nation and that there would not be any politics in regard to the fuel situation as

Save the Gasoline!

Suggestions Made by the N. A. C. C.

1—Do not use gasoline for washing or cleaning—use kerosene to cut the grease.

2—Do not spill gasoline or let drip when filling—it is dangerous and wasteful.

3—Do not expose gasoline to air—it evaporates rapidly and is dangerous.

4—Do not allow engine to run when car is standing. Cars are fitted with self-starters and it is good for the battery to be used frequently.

5—Have carbureters adjusted to leanest mixture possible—a lean mixture avoids carbon deposits.

6—See that piston rings fit tightly and cylinders hold compression well. Leakage of compression causes loss.

7—Stop all gasoline leakage. Form the habit of shutting off gasoline at the tank or feed pipe.

8—See that all bearings run freely and are well lubricated—friction consumes power and wastes gas.

9—Protect the radiator in cold weather—a cold engine is hard to start and is short in power.

10—Keep the tires fully inflated—soft tires consume power.

11—Do not drive at excessive speed. Power consumption increases at a faster rate than speed. Every car has a definite speed at which it operates with a maximum fuel economy.

12—Change gears rather than climb hills with wide open throttle—it saves car and gas.

13—Do not use cars needlessly or aimlessly. By exercise of forethought a number of errands can be combined so that one trip to town or elsewhere will do as well as two.

14—Reduce the amount of riding for mere pleasure by shortening such trips or cutting down their frequency.

Will Conserve Fuel

Government Appoints Administrator to Purchase Supplies for U. S. and Allies

WASHINGTON, D. C., Sept. 24—Special telegram—With the appointment of Joseph R. Guffey of Pittsburgh, Pa., a prominent oil man, general manager Consolidated Gas Co., Pittsburgh, as supervisor of purchases of petroleum and petroleum products for the army and navy is seen a possible effect on prices to the motor car owner and, further, may teach the car owner conservation of fuel. It is not known as yet just how far-reaching the powers of Mr. Guffey will be, but it is known that he will be petroleum administrator for the Government and will supervise the purchases of petroleum products both for the United States and its allies.

Mr. Guffey is connected in important capacity with dozens of leading oil concerns and the task which he has undertaken, in view of the present situation, will be a most important and trying one. He will seek not only to aid in conserving the supply, but his appointment is taken to indicate that the Government is preparing to supervise directly the production and sale of petroleum and its products.

Oil men in the middle west are confident that there will be no immediate change in prices but welcome any movement for the conservation of fuel that may be taken. Mr. Guffey's headquarters will be in Washington.

related to petroleum and its products but that all had buried political motives and were co-operating in the supreme work of winning the war. Mr. Bedford declared that petroleum was next to coal in importance due to the great amount of petroleum products to be used in aviation, motor vehicles, motor boats, etc.

The Government naturally will have the first call on all petroleum products produced both for our government and the allies. Motor car manufacturers and dealers should do their utmost to increase the fuel efficiency of their machines, and if such is done there will be no restrictions regulating their use as have been necessary in France and England.

TO TEACH AERONAUTICS

Detroit, Sept. 24—The Michigan State Auto School will have classes in aeronautical work commencing Oct. 1. The course will be under the direct supervision of a Curtiss expert, and the Curtiss Aeroplane Co. will provide airplane materials.

FORD TO HELP FLOAT BONDS

Detroit, Sept. 24—Henry Ford has been appointed to a special committee by Secretary of the Treasury McAdoo to aid in the floating of $2,000,000,000 of war saving certificates just authorized.

EMISE MOVES TO NEW YORK

Cleveland, Ohio, Sept. 24—C. A. Emise, vice-president of the Chandler company, has resigned from active work with the concern and moved from Cleveland to New York. He will retain his official position with the Chandler company.

GASOLINE EXPORTS INCREASE

Washington, Sept. 22—Exports of gasoline, naphtha, etc., for the seven months ending with July, 1917, show a total of 241,986,595 gal., of the value of $51,438,535, as compared with 198,147,553 gal. of the value of $36,828,431, for the same period in 1916. Crude oil exported for this period was as follows: 1917, 96,279,393 gal., value, $4,433,610; 1916, 94,822,841 gal., value, $4,233,164. Other figures for these periods are: Lubricating oil, 1917, 156,306,919 gal., value, $29,391,389; 1916, 154,517,974 gal., value, $24,646,749.

LONDON GAS $1.12 PER

London, Eng., Sept. 5—The price of gasoline keeps on increasing, the latest increase dating from Sept. 1 when the price as sold by the government was increased 16 cents per gallon so that the retail price throughout the country is now $1 per gallon. To this cost must be added 12 cents per gallon, which has to be paid by the holder of a license before he claims his right to purchase fuel. This brings the price up to $1.12 per gallon which marks a new high level in England.

Notwithstanding this high price dealers selling gasoline are charging approximately 15 per cent for profit. This bears out the fact that industries are doing everything possible to maintain themselves in sound financial condition, and that no matter how high the price goes the dealer is going to take his profit.

What Eliminates Noise?

Paper on Bakelite Describes Materials That Drive Away Unnecessary Sounds

Applications for Gears, Magnetos, Drives, and Pinions

CLEVELAND, Ohio, Sept. 21 — The Cleveland Section of the Society of Automotive Engineers held the first meeting after the summer recess at the Hollenden hotel tonight. Following the usual custom of this branch, a get-together dinner preceded the regular meeting. About twenty-five members were present at the dinner and fifty at the meeting which followed.

Ray P. Jackson, engineer of the Westinghouse Electric & Mfg. Co., presented a paper on "Fabricated Bakelite Materials" and their application to the automotive industry. The speaker placed particular stress on the use of Bakelite Mircata in engine gear construction. The paper in part follows:

While one is talking about insulation the motor car man has a casual interest centered chiefly on his ignition apparatus, but when one speaks about noise the car builder or engine manufacturer is likely to sit up and sharpen his ears and his pencil. Vibration and the striking of metal on metal are things he is always fighting. In this Bakelite product with a woven fabric imbedded in it, or looked at another way, this woven fabric, every particle of which is cemented together with Bakelite, we have an organic gear material as lasting as cast iron, but having a comparatively low modulus of elasticity.

In the transmission of power by means of spur or bevel gearing the impact of the teeth going into mesh has a great tendency to produce noise. The amount and tone of such noise depends primarily on the character of the materials from which the gears are made. Steel meshing with steel or iron at which speeds produces vibrations which cause a loud, piercing and often very disagreeable sound. Brass meshing with steel gives a sound of lower pitch and less piercing in tone. The brass having a modulus of elasticity less than half that of steel, flexes or "gives" more at the instant of impact and thus decreases the sharpness of the blow.

The material known as Bakelite Micarta D meets these requirements. It is vermin, moisture and oilproof and will withstand temperatures up to that of boiling water.

The motor car applications are for camshaft gears, idler gears, for magneto, pump and generator drive and in some cases for the generator pinion. A generator drive with micarta D gears offers one opportunity to use a high-speed generator of small size without danger of undue noise.

Universal - Standard Litigation at End

CHICAGO, Sept. 25—The long-standing litigation between the Universal Rim Co. and the Standard Parts Co., of Cleveland, has been terminated by an adjustment through which the Standard Parts becomes free to manufacture rims of every type embodying features covered by the so-called Baker groups of rim patents.

The Standard Parts Co. is advising the trade that it is now the only manufacturer in the field at present unfettered by any patent litigation of any kind. This being true, the company is restored to a position where its rim and tube division, formerly the Standard Welding Co., once more can claim the position it previously held without dispute.

The exact status of the Standard with respect to Baker has been in doubt for some time, during which there was a long period of actual litigation. The Universal Rim Co. brought suit against the Standard Welding Co., but the issue was settled out of court and a license taken. When Standard Welding merged in the Standard Parts consolidation, however, the license was not transferred, and the situation was made more complicated by a supposed nearness of interest between the Standard organization and the Perlman Rim Corp., with which Baker is in litigation.

A rumor was afloat this week in Detroit to the effect that the Standard Parts Co. denied settlement had been made between it and the Universal Rim Co., but that it probably would be. A statement by Earle K. Baker, president of the Universal Rim Co. to-day puts this rumor to rout. Mr. Baker declares that the settlement has been made and that the Standard Parts is now free to make rims under license from the Universal Rim Co. and to substantiate this showed a number of letters written by the Standard Parts Co. and sent to his office for distribution, these letters advising the trade that settlement had been made.

WESTCOTT BUSINESS INCREASES

Springfield, Ohio, Sept. 24—The Westcott Motor Car Co.'s business for the fiscal year ending June 30, was its largest in spite of delay caused by moving the plant from Richmond, Ind., to Springfield. A preliminary report for the first quarter of this year shows that sales for July, August and September are already more than double the average quarterly business for the fiscal year ending in June.

BRISCOE 1-TON TRUCK

Jackson, Mich., Sept. 21—The Briscoe Motor Corp. has designed a 1-ton truck which is interchangeable in many of its parts with the Briscoe model 24. It lists at $1,000 and is equipped with starter and windshield. The truck has a wheelbase of 132 in. It has a counterbalanced crankshaft, cone type of clutch, transmission in unit with the jackshaft, and chain final drive.

WILLIAMS FOUNDRY REORGANIZES

Akron, Ohio, Sept. 22—The Williams Foundry & Machine Co. has been reorganized and taken over by a new company of the same name, which filed preliminary papers of incorporation Sept. 15. The concern will take over the old Williams Foundry & Machine Co., of this city and will have a capital stock of $2,500,000—$500,000 preferred and $2,000,000 common stock. Changes have been made to relieve some of the older stockholders from active participation in the company, but the control will remain in the hands of local people as heretofore.

Contrary to reports, the management of the Williams Foundry & Machine Co. in the future, as in the past, will be completely independent of any rubber company. New officers will be J. K. Williams, president; C. Frans, treasurer; William Leary, secretary. The above with Lloyd Williams, manager of the engineering department and a member of the engineering firm of Goethals, Jameson, Houston & Jay, constitute the board of directors. The company now has building plans under consideration and intends a large expansion.

S. A. BUYER IS EXPECTED

New York, Sept. 21—S. H. Hirsch & Co., 82 Wall street, purchasing agents for motor car concerns in Spanish-American countries, announce that representatives of one of its clients, which is the leading distributor of motor car supplies in Argentina, will arrive in this city soon to place orders for motor car supplies. This concern previously handled European cars and supplies and for the last year has switched its trade to the United States, acting as distributing agents for Argentina and Uruguay.

FARM IMPLEMENT MAKERS MEET

Chicago, Sept. 24—The National Implement and Vehicle Association will hold its annual convention in Chicago Oct. 17-19. The association is planning to make the convention a conference of the implement, vehicle and farm-operating equipment industry with as many manufacturers in these lines present as possible. Manufacturing costs, materials, standardization, labor and transportation will be reported on and discussed. The association organized a tractor and thresher department recently.

RECEIVER FOR SUN COMPANY

Indianapolis, Ind., Sept. 22—The Sun Motor Car Co., Elkhart, Ind., has been placed in the hands of a receiver by the Superior Court of that city on a petition filed by the Monger Lumber Co., which has a claim of $213 against the company. Emil V. Anderson of Elkhart was made receiver and gave bond in the sum of $15,000. The petition for the appointment of a receiver sets out that the "company is in immediate danger of insolvency; and that it has been operated at a loss for the last six months." It is estimated that the total liabilities in excess of assets amount to $33,000. The petition further set forth that the company has numerous debtors who are pressing the company for settlements.

The company was established about eighteen months ago. R. Crawford is president and general manager. Leroy R. Miser is vice-president, and J. P. Blake is secretary-treasurer.

COURT OPINION FOR FORD

San Francisco, Cal., Sept. 21—The United States Circuit Court of Appeals here has handed down an opinion in a suit brought by the Ford company that establishes the right of the company to the exclusive use and control of the name "Ford" in the manufacture and sale of motor cars and also sustains the validity of the agency contract of the Ford Motor Co. and its right to control the sale of its cars in a restricted territory at a price fixed by it. In conclusion the court states:

"So far as we are advised by the contract, and that is all that we have before us, the plaintiff's (the Ford company) system of selling its cars cannot be made the means of laying an unreasonable restraint upon the free play of competition or dealing oppressively with the public. Presumably the contract was adopted in good faith, to accomplish an object which apparently in itself is legitimate. It is of no present interest that in some of its provisions it may be harsh, or even unenforceable as against the consignee; he is not complaining. If he desires to withdraw from the relation, that is his right, but he cannot at the same time claim all the benefits of the contract and repudiate its burdens."

Edward G. Westlake

EDWARD GEORGE WESTLAKE, or Eddie Westlake, as he is best known, died at his home in Chicago the evening of Sept. 19 *after a brief illness. To most of those in the industry, outside Chicago as well as in this district, Mr. Westlake's long service in matters pertaining to motoring is known already. He was born at Milwaukee, Wis., July* 25, 1868, *and had been connected with Chicago newspapers since before the motor car was a matter of news. It was with the advent of the early motor cars that he inaugurated his column devoted to news of this character as sporting editor of the Chicago Post, with which he had been since its founding in* 1890.

Mr. Westlake began his career in a day when racing was in its first stage; knew C. E. Duryea, winner of the first horseless carriage race; Schuster, pilot of the around-the-world Thomas roadster. On motor row Mr. Westlake had an acquaintance such as perhaps no other one man. With him as president the dealers had their organization called Motor Pals, only one of the associations in which he was concerned. His acquaintances extended to other fields to as wide an extent.

REO OWNERS TO SCHOOL

Chicago, Sept. 23—Reo owners in the Chicago district will begin going to school Oct. 3 and will continue each Tuesday evening and Saturday afternoon thereafter until they are able to make for themselves those minor adjustments and repairs which they, in common with practically all car owners, have been having done at the service station. The local Reo distributor sees in this move an opportunity of releasing a number of mechanics for possible government duty. Instruction will be given in such matters as cleaning spark plugs, draining and lubricating the engine, clutch, brake and valve adjustments, greasing the car, locating lighting troubles and replacing fuses.

Four hundred owners have enrolled so far and the company believes the innovation will meet with success from the very start.

RUSSELL DALE IS KILLED

Chicago, Sept. 22—Russell Dale, manager of sales of the Rich Tool Co. for the past five years, was shot yesterday evening and died today noon. Dale became involved in an argument with a negro employe of the Marmon branch here, in the course of which the negro shot him. The murderer so far has eluded capture. Mr. Dale was forty-three years old and previous to his connection with the Rich Tool Co. was with the Carpenter Steel Co., Chicago.

TO MAKE OKLAHOMA TRUCK

Muskogee, Okla., Sept. 24—The Oklahoma Auto Mfg. Co. has been organized in Muskogee, Okla., to manufacture the OK motor truck at $1,295. The company is capitalized for $1,000,000 and is selling its stock for $10 a share which is the par value. Officers of the company include W. R. Lantz, president, who is also the head of the Lantz Auto & Carriage Works; C. E. Harris, president of the Dixie Oil & Gas Co., first vice-president; E. J. Dunigan, president of the Muskogee Tool Works, second vice-president; W. G. Gibbons, treasurer of the Chestnut-Gibbons Wholesale Grocery Co., secretary; A. C. Trumbo, president of the Muskogee National Bank, treasurer.

The company is said to be installing equipment now and expects to be in production soon. Specifications of the truck include a Lycoming, four-cylinder cast en block, 3½ by 5 engine; multiple-disk clutch; selective sliding gear transmission, with center control; drop forged, I-beam front axle; worm gear type rear axle; Detroit

Lest We Forget

MOTOR AGE offers no apology for reprinting herewith stirring words by Franklin K. Lane, Secretary of the Interior. Today our business is war, and while Motor Age is a paper for motorists of all classes, it would be failing in its duty if it did not breathe that national spirit that must dominate all of us. This extract from Secretary Lane's oration is good stimulant.—EDITOR.

"WE HAVE determined on war. That is settled. There is no appeal from that determination. The people, under the law, have made it. To accept the conclusion of the Congress and the President makes this a republic.

"The American people, then, have determined to resist the aggressions of Germany.

"A Germany that broke her word with us.

"A Germany that sought to start revolution inside our borders.

"A Germany that sought to bring enemies upon us from the outside while we were at peace with her.

"A Germany that first borrowed money in this country and then grew angry because her enemies followed her lead.

"A Germany that grew angrier still because we sold munitions to her enemies, following an indisputable legal right which she herself frequently exercised.

"A Germany that in violation of her own word sank the ships which we sent to feed the starving Belgians.

"A Germany that pretended to fear a Russia that she knew did not have one-half enough rifles to arm her troops nor enough munitions to supply them for a month, nor enough railroads to carry the munitions they had.

"A Germany whose national policy was to teach each nation to distrust every other nation, whose military policy was to spread terror, whose naval policy was to prey upon neutrals.

"A Germany who believed that all other peoples must live only with her consent and bring all peoples into a constant state of subservience and fear.

"We are against this Germany because we cannot live with her. She is our enemy because she is the world's enemy. We fight her because we cannot be friendly with her. She does not know what friendship is, for she asks that her friends dishonor themselves. She is an organized ambition that is hostile to the world's peace.

"If there is a better Germany inside of her and she will show it, she can again be restored to the family of nations as a friend, but we have determined that we will fight the Germany that is revealed, the spying, intriguing, terrorizing Germany, until a better Germany honestly says: 'We want to live upon the same conditions as our fellows. We realize that the day of another Roman Empire is passed. We are conscious that no man can play Napoleon now. We wish to play the nineteenth century game under nineteenth century rules. We believe that with our genius for organization and our intense absorption in our work we can win our way to a place in the sun without spies, without intrigues and without terror.'

"It is now 1,900 years since Caesar defeated the Germans in France. When they came asking terms he said to them: 'Go back whence you came, repair the damage you have done, and give hostages to keep peace for the future.' This war will end when Germany knows that she must give hostages to keep peace in the future. It was the ancient and barbaric custom to take princes and high men as hostages, and this custom Germany followed when she entered Belgium. But the world does not ask such hostages today. It is the problem of world statesmanship to discover what kind of hostage Germany can give when she has been convinced that her dream of world overmastery cannot come true. Under civilization we all give hostages to each other. That is the basis on which we live. We place in the other man's hands something sacred which we forfeit if we break the common law. This is no humiliation to us. It is the price we pay for life among our fellows. Germany must do the same.

"We shall make war in earnest for we know that if Germany wins the world will turn aside from the system of law and liberty which we know, and exalt that military caste and system which is the historic enemy of personal liberty. We make war in France that we may not be compelled to do battle here. Let Germany have Canada or Mexico, or even Cuba, and we would go to our daily work like the Pilgrim Fathers with our guns in our hands. It may be hard that the clerk must be taken from his desk, the lawyer from his case, the fireman from his engine, the farmer from his plow, the mechanic from his lathe—but if they did not go now, they and their sons, other clerks and lawyers and farmers and mechanics would live one long dread day of fear."

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steel product springs; artillery type wheels; a worm-and-gear type left hand drive steering gear; $\frac{17}{32}$ channel steel frame; Carter special carbureter; electric light and starting system with Delco ignition.

LONDON USES MORE ELECTRICS

London, England, Sept. 1—As soon as the price of gasoline passed the 50-cent mark the use of the electric vehicle came in for more consideration than it has received since 1899 and 1900, when there were many passenger electrics in both private and public service. The electric truck then was used, but it has had an uphill progress until the gasoline price went so high electricity showed up very favorably on the cost sheet.

The electric is gaining constantly and now railway companies have 300 electrics in service and all the chief London stores are using fleets of electrics. In addition to the cost of fuel being a factor the electric has the additional advantage of being driven readily by girls, who are now practically the only drivers available for parcel delivery work.

It would not be surprising that due to present and further restrictions in gasoline supply for commercial uses electrics will increase very rapidly, and it would not be surprising if the end of the war would see electric vehicles in very general use in England.

CHALMERS AGENCIES UNCHANGED

Detroit, Sept. 24—Maxwell Motor Co. agencies will not take over Chalmers agencies, nor will Chalmers agencies take over Maxwell agencies, according to an announcement made by the Chalmers Motor Co. in answer to an erroneous report which gained circulation last week. The Maxwell company states that it is not its intention to make alterations in the arrangements with agencies and distributors.

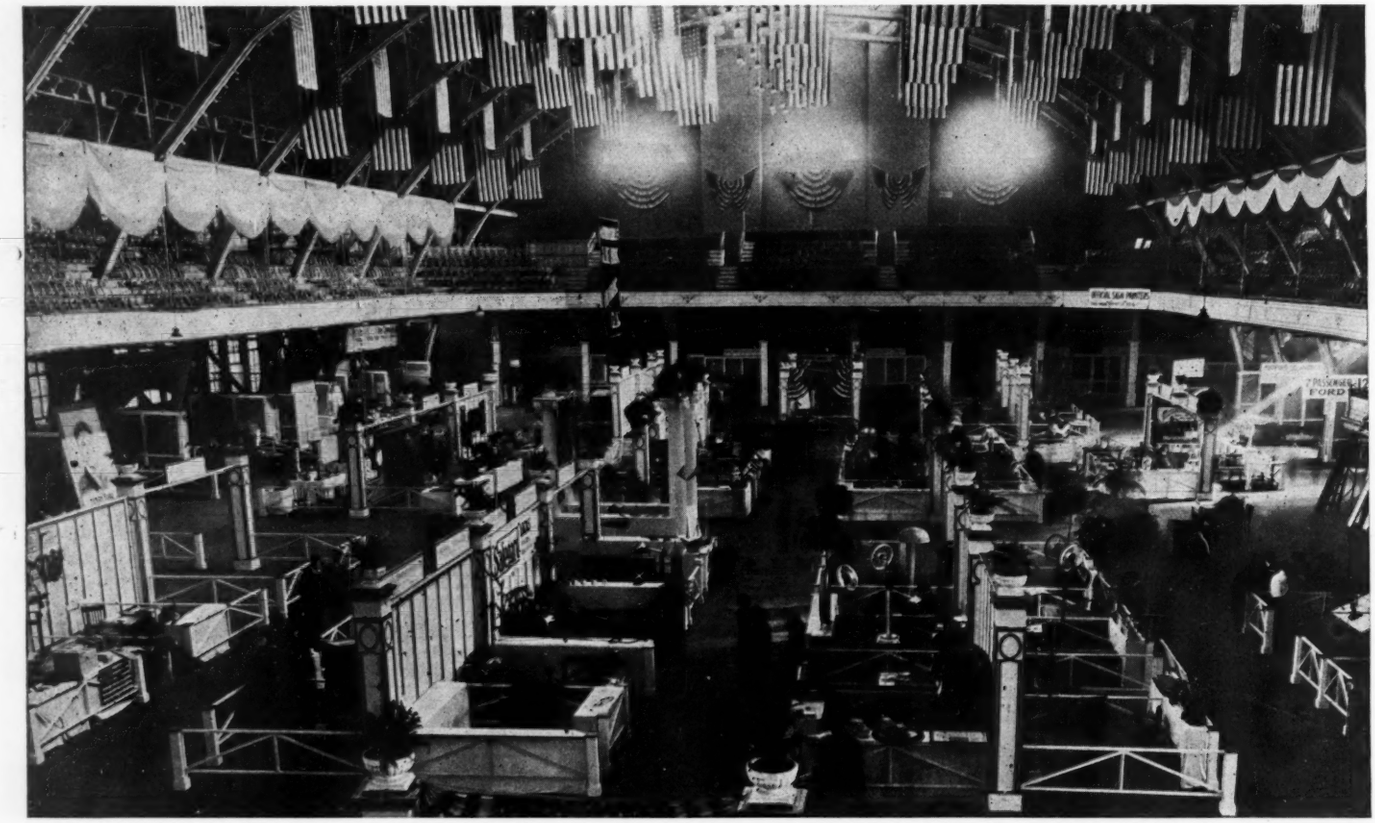
ELECTRICS IN POSTAL SERVICE

Chicago, Sept. 24—A glance over the field of the electric field in this country shows that the postal service is using electric trucks in several cities. St. Louis, for instance, has had a fleet of electric trucks in its postal service for more than six years. The trucks work from 5:45 a. m., until 11:30 p. m., and average 30 miles a day. In Boston the postal service uses fifteen electric trucks, which are operated on the battery-service plan. The trucks make runs of 25 miles a day.

Perhaps the largest electric postal fleet is that of the New York Postal Transfer Service which operates forty-seven electrics. These trucks have been in service three years and work two 10-hr. periods a day.

Accessory Show in Full Swing

Visitors to Exposition Bring Good Business to Dealers — Another Display Next Year



Full length view of Coliseum in which the National Exposition for Ford Accessories is being held

CHICAGO, Sept. 25—Fords and their fitments are literally the whole show at the Coliseum here this week. The great hall which has held the national motor car shows and nomination of presidential candidates, to-day is devoted to a display of furnishings for the Ford. It is called the National Exposition for Ford Accessories and the sessions of its second day ended last night with prospects that the show will be a successful business-getter.

The exposition, which opened Saturday evening and is to run until next Saturday, is devoted to showing of special accessories and fittings for the Ford. Its dual purpose is to interest the general public in Ford accessories and to offer a central market for jobbers in arranging their lines for the coming season. The latter reason is its chief one. Yesterday proved a good business day, probably the best report coming from the Gray-Heath Co., which reports sales amounting to $50,000 to jobbers. One truck-maker exhibitor sold two attachments Saturday. Most of the attendance yesterday appeared to be of a class that did not include the curiousity seekers, and at nearly every booth salesmen were busy with order books. The official attendance figure yesterday was 6500, of which one-eighth was paid.

By Darwin S. Hatch

When the show opened Saturday evening, there was no evidence of the jam of exhibits and visitors which has characterized the opening hours of previous motor car exhibitions in that mammoth hall. With the huge main floor given over to approximately 150 exhibit spaces where are shown the products of about 250 manufacturers there was plenty of room for the 3,800 visitors.

Decoration Is Pleasing

There is a light and almost delicate scheme of decoration, in pleasing contrast to the massive and ponderous prodigality of scenery which has been a feature of many of the previous expositions devoted to motor cars and their fitments. Manager Buelow has increased the effect of spaciousness by the use of low pillars and panels of white and gold separating the booths, the pillars crowned with ferns and the sidewalls in green. The ceiling is hung with hundreds of flags.

Spaces around the walls are devoted to Ford truck attachments, special Ford bodies, etc., and the inside to the smaller accessories. There is an exhibit of Ford passenger cars showing each of the stock bodies. These are shown by a local subdealer.

The motor industry has been uncertain as to the success of the show. This comes about from the fact that none of the organizations which have been connected with the national motor car shows have evidenced any great amount of pleasure in the prospect of the Ford accessory exhibit. The Motor and Accessory Manufacturers, who sanction the accessory exhibits at the national motor car shows, maintained that this is an outlaw and refused a sanction, giving the impression that exhibitors here would not be permitted to show under its roof. The National Automobile Chamber of Commerce, which stages the big shows, takes the same view as the M. & A. M. The National Association of Automobile Accessory Jobbers has refused its endorsement.

Nevertheless there are represented among the exhibitors many of the manufacturers which belong to the jobbers' association and the products of several members of the M. & A. M. are exhibited by jobbers.

Among the more widely known accessories which are exhibited by their manufacturers may be mentioned Osgood lens, Automobile Blue Books, Smith Form-A-Trucks, Redden truck formers, White Star Refining Co. products, Bailey Non-stall differentials, Pennsylvania clocks, S. C.

Johnson & Son's products, Ahlberg bearings, Chicago Pneumatic Tool Co. truck makers and kerosene systems, etc.

Products of other accessory manufacturers are shown by jobbers and dealers. Among these are Houk wire wheels, shown by the Wire Wheel Corp. of America; Hassler shock absorbers, shown by the Hassler Distributing Co., a local distributer; and the products of other leading accessory makers, among them L. B. Halladay Co., New York Coil Co., Reflex Spark Plug Co., Continental Piston Ring Co., Standard Speedometer Co., and others are shown by the Gray-Heath Co. Gray & Davis starters were shown by the U. S. Auto Supply Co.

All in all, it will be seen that the industry is pretty well represented, particularly as it applies to Ford supplies. The real idea of the show is to get the Ford supplies together for the benefit of dealers and jobbers in making up their line for the new year, and it seems the arrangement and exhibits are such as would accomplish this result—provided the dealers and jobbers appear.

Whether or not they will appear in sufficient numbers to make the show a success from that standpoint, it is too early as yet to say. It is true that there were a number of large jobbers on hand the opening night. One jobber from Saskatoon, Canada; another from Winnipeg and another from Portland, Ore. These three have stayed over from the jobbers' convention at French Lick, Ind., purposely for the show. Aside from these, jobbers were not many Saturday. This is to be expected as those from territory adjacent to Chicago will make their visits this week.

To one who is accustomed to the first-night jams at the big motor car shows, the small attendance Saturday was disappointing at first thought. However, there was a ray of sunshine for the management in the knowledge that, whereas the hundreds of free tickets given out for the older shows are for admission only on the opening day and the house is largely paper, the 250,000 free tickets given out for the Ford accessories show are good at any time during the week.

Little First-Night Paper.

The proportion of visitors who paid their half-dollar is unexpectedly large, receipts at the door being over $200, which means that 400 people paid their way in. If this record is kept up the Ford ambulance which is to be purchased with the first $750 of gate money and presented to the Red Cross could be supplied with most of the equipment at the exhibition as well and still leave money in the treasury.

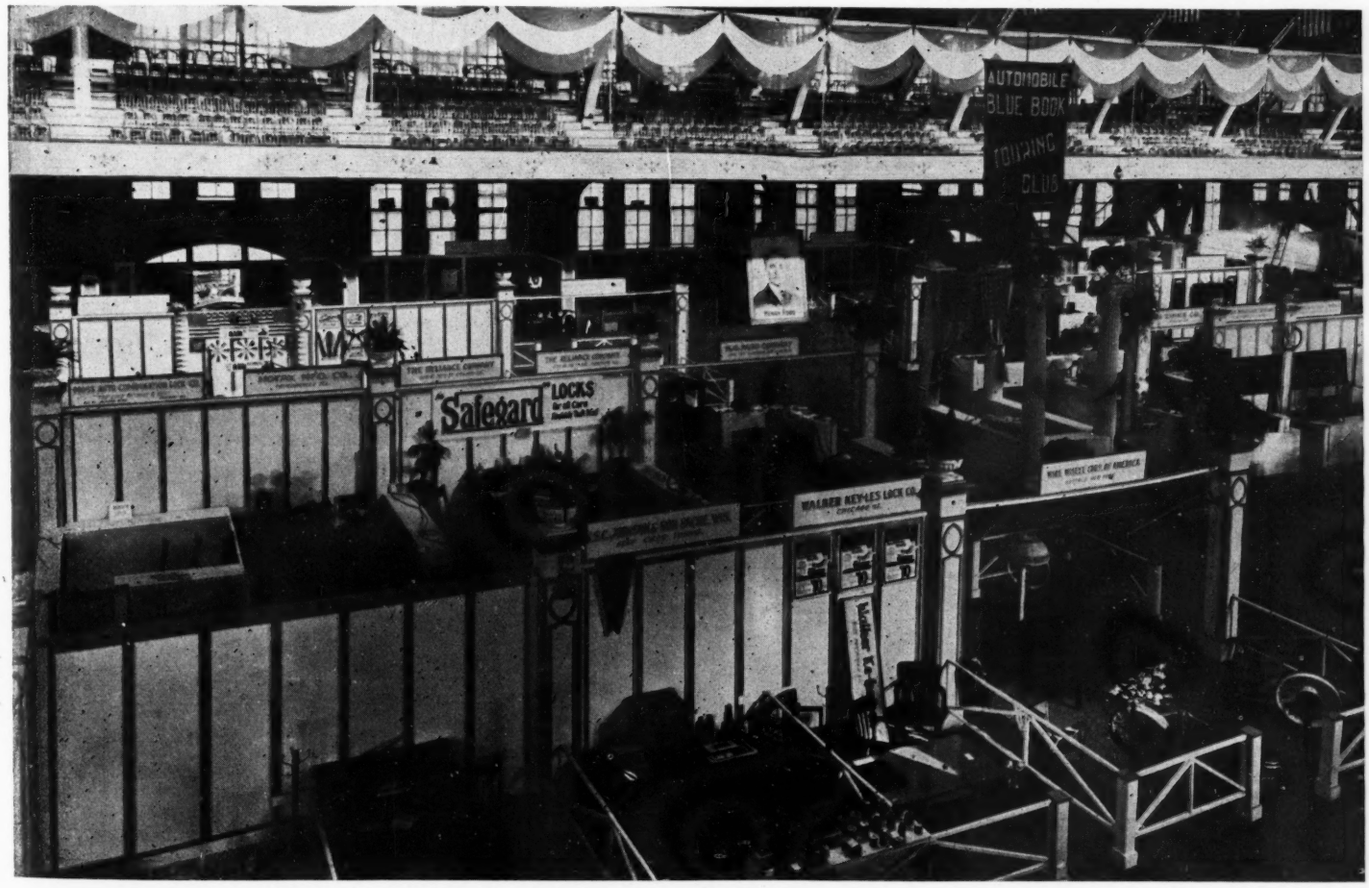
The show was financed by sale of stock and seems to be financially successful, as when the show closes Monday night a dividend of 100 per cent is to be declared, according to the executives. This means that with all of the allotted spaces sold, the income from the sale of space is sufficient to pay the expense of staging the show and pay the stockholders back the money they put in.

Plans now are to stage a similar show on the same basis next year. It is planned to enlarge the scope of the exhibition in the future and, instead of confining it to Fords, to have it cover the field of accessories for all cars. In line with this, the name of the organization which is promoting the Exposition is being changed so that the word "Ford" is dropped and the association now becomes the National Exposition for Accessories.

The exhibit which first meets the eye of the visitor as he enters the Coliseum is that of the Automobile Blue Book's touring information booth. This occupies the exact center of the hall, and is just inside the main entrance. One of the exhibits which attracted the crowd was that of the Ehman Tire & Rubber Co., at which Ford tires were made up complete with the exception of the vulcanizing.

In taking up the exhibits, as a whole, every conceivable fitment for the Ford car is on view, from apparatus for turning the Ford roadster into a truck down to a platinum point for a spark coil. There are ten truck-making attachments at the Coliseum. Wire wheels are there in abundance, being exhibited by five different concerns.

Police reports that 30,000 Fords were stolen in the United States last year explain the popularity of Ford locks, and there are eight different makes on exhibition. Special bodies and special all-year tops appear in many styles, one being an arrangement to increase the Ford wheelbase and seat seven passengers. The most striking of the special body jobs is that of the Auto Remodeling Co., which is a white and gold creation, worthy of appearing in the National automobile shows.



Looking over the exposition from the entrance, showing Henry Ford's picture in the background in the place of honor

Chevrolet Sets New Record

Wins Harkness Trophy With Speed of 110.4 M. P. H.

By Stanley P. McMinn

Harry Harkness, donor of the trophy, presenting the Harkness Trophy to Louis Chevrolet, who not only won the race but set up a new mark

SHEEPSHEAD BAY SPEEDWAY, Sept. 22—Louis Chevrolet won the Harkness Trophy race today, but he did not have things all his own way, even though he did set up a new mark for speedway cracks to shoot at. He turned off the 100 miles in 54:20:98, which is at the rate of 110.4 m.p.h. and is just 2:08:52 better than his own time when he beat Lewis in a Hoskins on the Chicago speedway Labor Day. Chevrolet's time at Chicago was the best that had been done up to then for cars in the 231-300 cu. in. class, both races being for cars of this size.

It was de Palma who made Chevrolet extend himself. At the end, the Packard pilot was 1:57:42 behind him and going great guns to make up time lost due to tire trouble when the race had gone but a quarter of the distance. De Palma stopped after running 46 miles to change a left front tire and though he lost but 20/55 sec., he never made it up and from that time on Chevrolet was never headed.

Resta Out at 13 Miles

Resta, to whom the greatest crowd in the history of the track had pinned its hopes, went out early in the race. A broken camshaft put his Frontenac out of the running after he had covered only 13 miles. But before he went out the race was a beautiful three-cornered fight between Chevrolet, who had the lead; de Palma, never more than 100 yds. behind him, and Resta, close on de Palma's rear tires.

Futurity Handicap

Four Heats of 10 Miles Each

	Handicap
Heat 1—Le Cain, Delage,	40 sec.....6:07.60
Heat 2—De Palma, Packard,	scratch..6:20.40
Heat 3—Boyer, Frontenac,	scratch.....6:07.51
Heat 4—De Palma, Packard,	scratch..6:11.60

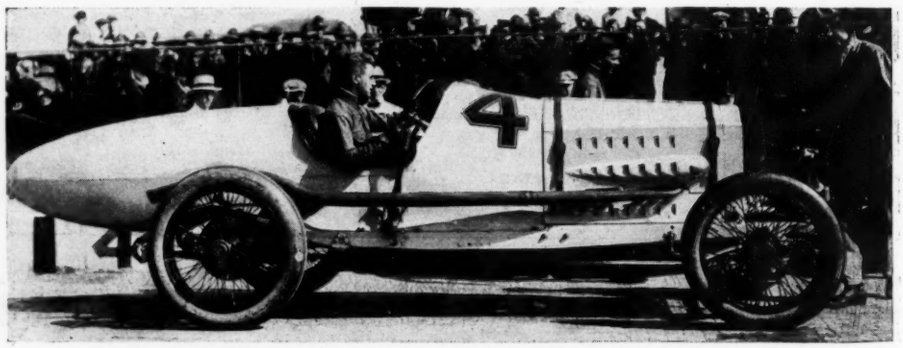
When Resta went out the remainder of the field was bunched nearly half a lap in the rear and might have been covered by a blanket. Henderson in a Duesenberg led this bunch, with Vail in a Hudson, Hearne in a Duesenberg and Henning in a Mercer almost neck and neck with him.

For fourteen miles Chevrolet and Resta were one, two. And it was plain that de Palma was laying for a chance to shoot by. Beginning the 16th mile he nosed out in front and held the lead until the 20th, when Chevrolet again pushed out in front.

From then on Chevrolet had things pretty much his own way, though a tire change might have put him back and it was expected his turn would come any second because of the terriffic pace he was setting. At that time his average was 110.7 m.p.h.

The weather was ideal and the greatest crowd that ever packed itself into the grandstand passed the ticket takers. When the race started there was scarcely a vacant seat in the stand and spectators were perched on the roof girders like monkeys.

One reason for the crowd undoubtedly



De Palma was second in the Trophy race with an average of 106.5 m. p. h. Tire trouble overtook him at 46 miles

Times of Racers at Sheepshead Bay

Driver	Car	10	20	30	40	50	60	70	80	90	100	M.P.H.
Chevrolet	Frontenac	5 :31.65	10 :52.00	16 :12.85	21 :02.15	26 :57.05	32 :25.15	37 :52.95	43 :21.15	48 :51.75	54 :20.98	110.4
De Palma	Packard	5 :32.50	10 :53.40	16 :18.30	21 :02.56	27 :17.60	33 :46.20	39 :11.55	44 :47.10	50 :31.85	56 :18.40	106.5
Hearne	Duesenberg	5 :47.10	11 :20.90	16 :59.85	22 :51.75	27 :10.55	33 :58.25	39 :44.40	45 :25.15	51 :03.45	56 :41.15	
Mulford	Frontenac	5 :44.15	11 :20.20	17 :00.20	22 :52.30	27 :10.05	33 :58.70	39 :43.10	45 :24.55	51 :04.30	56 :41.50	
Vail	Hudson	5 :45.30	11 :21.25	11 :58.70	22 :38.40	27 :09.25	33 :59.20	39 :43.50	45 :24.90	51 :03.90	56 :41.87	
Hickey	Hudson	6 :03.30	11 :52.50	16 :27.30	22 :12.20	27 :56.30	32 :25.95	40 :19.65	46 :02.75	51 :45.40	60 :39.70	
Henning	Mercer	5 :45.75	11 :23.55	18 :06.75	22 :38.05	27 :09.65	33 :59.55	39 :43.95	45 :32.95	51 :26.50	60 :48.85	
Milton	Duesenberg	5 :46.20	11 :22.35	16 :59.45	22 :55.55	27 :38.95	33 :02.86	39 :23.25	46 :23.30	51 :04.60	60 :55.20	
Benedict	Benedict	5 :51.15	11 :46.85	16 :33.10	22 :32.95	27 :17.05	34 :22.60	40 :18.50	46 :13.05	52 :10.20	61 :42.80	
Resta	Frontenac	5 :47.60	Out, broken camshaft.									
Henderson	Duesenberg	5 :44.55	11 :20.55	16 :58.30	22 :36.66	27 :02.55	33 :46.55	39 :21.75	44 :58.20	50 :38.55	.....	
Lewis	Hoskins	5 :48.25	11 :27.30	17 :07.50	22 :40.95	27 :21.50	34 :12.79	40 :00.05	45 :45.85	51 :34.35	60 :48.30	
De Vigne	Delage	5 :46.65	11 :22.95	Out.								
Le Cain	Delage	5 :48.70	11 :55.20	Out.								
Haibe	Haibe	6 :27.60	11 :39.45	17 :51.00	Out.							
Boyer	Frontenac	.....	11 :01.50	19 :50.35	22 :22.35	.....	34 :05.85	39 :48.40	44 :53.15	51 :22.55	.....	
Alley	Pan-American	5 :54.55	11 :25.90	16 :26.95	Out.							

was that popular prices were charged for seats. Reserved seats sold for 50 cents up to $2, the latter figure being for box seats. Another reason was that the principal race was short and there was every promise of action in the series of sprint races which rang down the curtain.

It was these short races, by the way, that furnished the real thrill of the day. The spectators had no trouble at all in following every move, and when de Palma, driving from scratch, barely nosed out Lewis in the second heat, the crowd rose up in their seats and let out a howl—the first real demonstration of the day.

Incidentally, it was in the short sprints that de Palma took his revenge. In the final heat he beat Chevrolet by inches in the best race that metropolitan motorists have seen in years. For 10 miles he inched up on the fleeting Frontenac and until the tape was crossed it was either driver's race.

Chevrolet .18 Sec. Behind

De Palma's time for the sprint was 6:11:60 and Chevrolet was just .18 sec. behind him.

Resta's failure was a great disappointment to the crowd. It was the first time he had been seen at the wheel of anything but a Peugeot, and as the Frontenac was reported very fast, great things were expected of him. Furthermore, his sensational wins of last year were fresh in the minds of spectators who knew that the field was out to beat him.

In the early stages of the race, Resta evidently started his usual program. He planned to open up a big gap between himself and the rest of the field as a measure of safety and to allow for possible tire changes. But the pace he set was too great for the Frontenac.

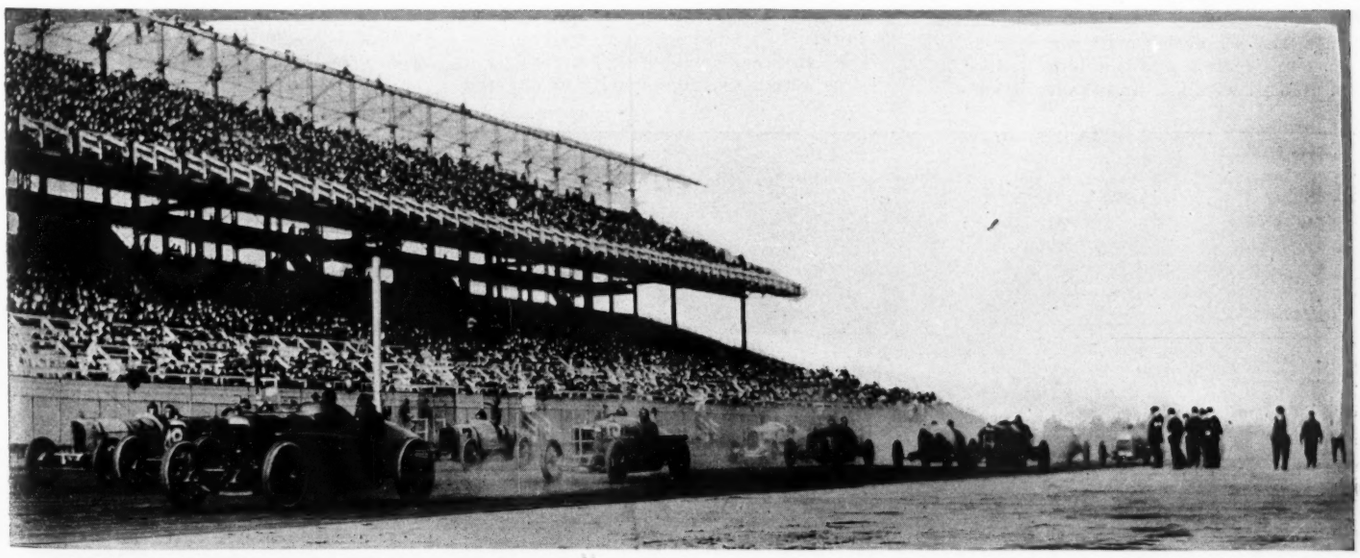
When it came to a show-down between de Palma and Chevrolet, de Palma seemed to have the edge on the Frontenac driver. For repeatedly he would brush right up to the rear tires on Chevrolet's mount in the backstretch only to let a gap lengthen out between the cars on the home turn.

At the half-way mark, Chevrolet's time was 26:57.05 and at that time he was traveling at the rate of 111 m.p.h. De Palma was then only 20.55 sec. behind him, with the rest of the bunch nearly half a lap behind.

When the three-quarter mark had been passed, Chevrolet had increased his lead to 1:18.6 and Henderson in a Duesenberg was just 10.2 sec. behind de Palma. The rest of the field was pretty well strung out by this time, most of them having been lapped twice by Chevrolet.

Over the whole meet there was a thin military dressing. In the great oval inclosure a battalion of Uncle Sam's boys are encamped and it was some of these

Start of the 10-mile which de Palma and Chevrolet's struggle for the lead made the best race New York has had in years



Getaway of the racers at the beginning of the Harkness Trophy 100-mile race at Sheepshead Bay speedway

Engine Sizes and Equipment at Sheepshead Bay

Driver	Car	Bore	Stroke	Disp.	Carbureter	Ignition	Plugs	No. plugs	No. valves	Location	Tires	Wheel-base	Wheels	Pistons	Oil
R. de Palma	Packard	2.66	4.5	300	Packard	Delco	Bethlehem	12	24	Head	Goodyear	112	Rudge-W.	Packard	Monogram
L. Chevrolet	Frontenac	3.87	6.37	298	Miller	Bosch	Bethlehem	4	16	Head	Goodyear	104	Rudge-W.	Lynite	Castor
Joe Boyer	Frontenac	3.87	6.37	298	Miller	Bosch	Bethlehem	8	16	Head	Goodyear	104	Rudge-W.	Lynite	Castor
R. Mulford	Frontenac	3.87	6.37	298	Miller	Bosch	Bethlehem	8	16	Head	Goodyear	104	Rudge-W.	Lynite	Platt & W.
D. Resta	Frontenac	3.87	6.37	298	Miller	Bosch		8	16	Head	Goodyear	104	Rudge-W.	Lynite	Oilzum
E. Hearne	Duesenberg	3.75	6.75	298.2	Miller	Bosch	Rajah	8	16	Head	Goodyear	106¾	Rudge-W.	Levett	Oilzum
T. Milton	Duesenberg	3.75	6.75	298.2	Miller	Bosch	A. C.	8	16	Head	Goodyear	106	Rudge-W.	Levett	Oilzum
P. Henderson	Duesenberg	3.75	6.75	298.2	Miller	Bosch	A. C.	8	16	Head	Goodyear	106	Rudge-W.	Levett	Oilzum
J. Devigne	Delage	3.63	6.75	286.0	Miller	Bosch	A. C.	4	16	Head	Goodyear	106	Rudge-W.	Levett	Castor
J. LeCain	Delage	3.63	6.75	286.0	Miller	Bosch	Bosch	4	16	Head	Goodyear	106	Rudge-W.	Levett	Castor
Ira Vail	Hudson	3.5	5	288.6	Hudson	Delco		6	12	Side	Goodyear	105½	Rudge-W.		Oilzum
D. W. Hickey	Hudson	3.5	5	288.6	Hudson	Delco	Rajah	6	12	Side	Goodyear	105½	Rudge-W.		Oilzum
Otto Henning	Mercer	3.87	6.37	300.7	Miller	Bosch	Rajah	8	16	Head	Goodyear	106	Rudge-W.	Levett	Oilzum
W. Haines	Mercer	3.87	6.37	300.7	Miller	Bosch	Rajah	8	16	Head	Goodyear	106	Rudge-W.	Levett	Oilzum
D. Lewis	Hoskins Sp.	3.75	6.75	298.2	Miller	Bosch	Rajah	8	16	Head	Goodyear	105	Rudge-W.	Levett	Oilzum
T. Alley	Pan-American	3.63	7	292	Miller	Bosch	Bosch	8	16	Head	Goodyear	106	Rudge-W.	Miller	Oilzum
G. Anderson	Miller Sp.	3.63	7	292	Miller	Bosch	K. L. G.	8	16	Head	Goodyear	104	Rudge-W.	Miller	Castor
Ora Haibe	P. A. L. C.	3.63	7	292	Miller	Bosch	Rajah	8	8	Head	Goodrich	106	Houk		Oilzum

All cars were equipped with Boyce Moto-Meter and Hartford shock absorbers.

boys who guarded the course. During the intervals between the races De Loyd Thompson did spirals and loops and dips in a military type airplane and several times brought the spectators breathless to their seats. Finally he wound up his exhibition with one of the prettiest landings ever seen, bringing his plane to a standstill on the track directly in front of the grandstand.

Planes and Trucks to Postoffice?

Bill May Transfer Military Vehicles and Airplanes After War

WASHINGTON, D. C., Sept. 22—The motorization of the postal service of the United States, toward which important steps have already been taken, is to be wonderfully extended with the close of the present war and, possibly, to a considerable extent, before that time as a result of an amendment to Senate bill authorizing experiments in motor truck delivery by the postoffice department. This amendment, adopted following conferences between the Postmaster General and the Secretary of War, and which has been approved by the President, provides that the Secretary of War may turn over to the postoffice department all military airplanes and motor vehicles not serviceable for military purposes, or which after the war may be dispensed with for military purposes.

Both Italy and France are now making use of airplanes no longer suitable for military use for the delivery of the mails. Italy has an aerial mail route from her coast to Sardinia and is able to deliver 500 lb. of mail within 2 hr. France has a similar aerial mail route between her coast and Corsica.

The plan of the postoffice department is to use such motor trucks as it may get under the above authorization for the extension of the parcel post service. This amendment was added to the bill and $300,000 is appropriated for use by the Postmaster General in conducting experiments in the operation of motor vehicle truck routes in the vicinity of such cities in the United States as he may select.

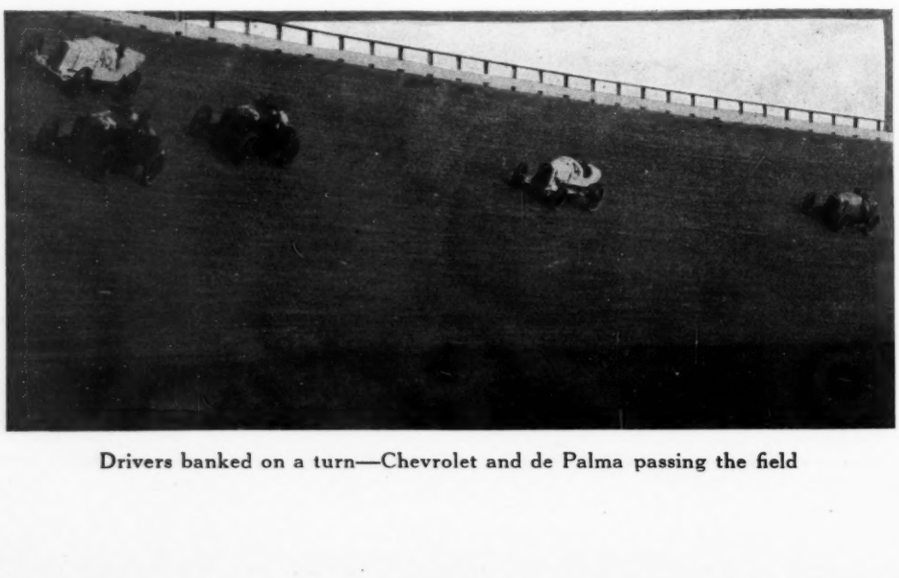
HIGHER TAXES FOR FLORIDA

Tampa, Fla., Sept. 21—All motor cars in Florida of more than five-passenger capacity will be required to pay a higher license tax the coming year. From Oct. 1 to Jan. 1 a license for one-fourth a year will be collected. Counties and towns will not be allowed to charge except for cars used for hire, when they may charge half the state license. License fees are as follows:

For any car and other motor-driven vehicle with a seating capacity of one and not more than five persons, $5; of 25 but not more than 40 h.p., $12; of more than 40 but not more than 60 h.p., $15; of more than 60 h.p., $30; any type seating ten or more passengers, $100.

Trucks used for hauling any load other than passengers will be charged $10 for those not exceeding 1 ton; trucks more than 1 but not more than 2 tons, $25; those more than 2 but not more than 4, $35, and those more than 4 are $100.

Motor vehicles licensed by any other states will be subject to a license after they have been in this state for thirty days.



Drivers banked on a turn—Chevrolet and de Palma passing the field

WAR COMMITTEE REORGANIZES

Washington, Sept. 21—The committee of automotive transport of the Council of National Defense has been completely reorganized and in the future will be known as the automotive products committee of the War Industries Board. H. L. Horning, in charge of tractor and truck organization, is chairman, and the other members are: Colonel Chauncey B. Baker, Quartermaster's Corps, who will be in charge of transportation; Coker F. Clarkson, general manager of the Society of Automotive Engineers, who will have charge of matters between the S. A. E. and the new committee; Frank W. Russell, representing the Aircraft Manufacturers' Association; C. W. Henderson, representing the Motorcycle and Allied Trades Association; Henry R. Sutphen, representing the National Boat & Engine Manufacturers' Association; Hugh Frayne, representing the labor organizations.

CANADA EXHIBITS TRACTORS

Toronto, Ont., Sept. 21—To-day ended the third annual tractor demonstration exhibition of modern farming machinery and implements, held under the auspices of the Department of Agriculture of the Province of Ontario. This is the only power plowing demonstration besides that at Fremont, Neb., which was approved by the National Association of Tractor Manufacturers, and it is intended to popularize the tractor among the farmers not only in the Province of Ontario, but of the whole eastern part of the North American continent. The demonstration was held under the same conditions as that at Fremont and consequently was subject to some of the same criticism that was passed on the latter event. A more extended story covering this demonstration will be given next week.

Higher-Priced Car Sales Decrease

Small Makers of Low-Priced Cars Have Difficulties, Though Large Producers' Business Good

DETROIT, Sept. 24. Special Telegram —The smaller manufacturers of assembled cars selling at popular prices are experiencing many difficulties. As with the higher-priced cars, sales have decreased despite the puzzling fact that large manufacturers of low-priced cars are enjoying record-breaking business. In addition, many manufacturing problems have arisen, some makers of parts are turning to war orders; others are unable to secure materials, and still others are withholding parts from the smaller car companies because of lack of faith in their financial credit and because of current predictions to the effect that the smaller manufacturers will be unable to weather the materials, labor and other war conditions now existing and promising to become even more perplexing in the near future.

Manufacturers of higher-priced cars continue the reports of declining sales, and one large concern which for August reported a 20 per cent increase in sales of its product which sells for more than $3,000 now states that sales have fallen to a marked extent the last two weeks.

The larger companies manufacturing popular-priced cars are still finding business better than last year. Buick Motor Co., which is turning out 544 cars daily this month, plans a schedule of 625 cars per day in October. The Saxon Motor Car Corp., which only a few months past was experiencing sales difficulties, now reports large business and states that last week witnessed the highest sales marks since the spring drive.

What Chrysler Says

Walter Chrysler, president of the Buick company, states: "I have a firm conviction that business this winter will be better and more profitable than any winter season in our company's history. The large expenditures for foodstuffs, war munitions and other supplies creating in turn an extraordinary labor demand with consequent high wages must result in a very prosperous season unless our army or navy meets with some disaster which, of course, will affect the market and in turn tend temporarily to hurt business. All our dealers and districts are now asking for more than their allotments and come to the plant at Flint in the hope of getting a sufficient number of cars. We rapidly are increasing our manufacturing schedule and would sell 15 or 20 per cent more cars if we could make them. Our truck department is doing very well. We produce twenty-five trucks per day and would be able to sell fifty daily if we had the materials for their manufacture."

The Ford Motor Co., Willys-Overland Co., Maxwell Motor Co., Dodge Brothers, Paige Motor Co., Oakland Motor Co., Reo Motor Co., Chevrolet Motor Co., Dort Motor Co., United Motor Co., United States Motor Co. and Republic Truck Co. all report excellent business.

Lansing companies, including Reo and Olds, already are beginning to experience freight difficulties. They are making plans for overland driveaways for the coming winter and urge their dealers to start the driveaways before the very heavy cold weather sets in. The Reo company is producing 100 cars per day, and both Reo and Olds are operating at full production capacity.

R. C. Rueshaw, sales manager of the Reo company, who has just returned from the Northwest, states that the Northwest now is reaping the results of large crops and great shipments of lumber, wool and minerals and is an excellent field for motor car sales.

Truck business is reported by all manufacturers, regardless of price or size of product, to be breaking all past records. The general report displays a demand far in excess of the supply.

There is a shortage of labor, both skilled and unskilled, and wages are advancing constantly. Shipping conditions continue fair, with pessimistic predictions for the winter season made by all traffic managers.

U. S. Orders Steel Priority

WASHINGTON, Sept. 25—Special telegram—Far-reaching plans for the manufacture of airplanes, trucks, motor cars and parts by the Government will be expedited under the regulation just issued by the priority committee of the War Industries Board. Instructions have been issued to 25,000 firms, corporations, associations and individuals, engaged in the production of iron and steel to give priority on orders to those engaged in the manufacture of products using these materials. The instructions fix war work first; that having to do with the interest of the national welfare second, and all work not included in these two classes, third. In addition, of course, to engine construction, other necessary work involving steel and iron construction, is given protection in the way of priority.

The combined effect of the fixing of new prices for steel and the making of priority orders under which Government business is to be given the preference is to assure truck manufacturers sufficient steel to turn out their orders, and if the price is agreed to by the entire steel industry, the other truck and motor car manufacturers possibly will benefit by the lower prices.

Some predict that the effect to the carrying out of the priority order will be the supplying of truck manufacturers and the motor car industry generally with needed material ahead of other concerns whenever Government orders are being filled.

As to the steel situation under the new price fixed, it is entirely a question of quantity production. If the government can assure the steel makers of the use of great quantities of steel, then the producers of steel will turn it out at fixed prices as the result of being able of doing away with expensive sales establishments.

Detroit, Sept. 25.—Special telegram.—The announcement fixing the price of carbon steel at the mills and arranging a definite priority of shipment will have a clearing effect on the industry, in the opinion of leading factory heads and purchasing agents of this city. The report of the Government is taken as good news by the majority of them, because it is felt that the mills can produce economically the steel at the $6 per hundred rate established by the Government, and that inasmuch as the Government has been very generous with the steel mills in paying a price well in advance of what steel could be bought for a year ago no trouble should be experienced in getting an adequate quantity for the motor car manufacturer regardless of Government demands.

Another effect which the establishment of the price will have is to give a uniformity in the market which is sure to be helpful. Makers here feel that the steel mills readily can take care of the wants of the motor industry in spite of other existing demands, but that if there is a limiting factor at all it will be traced to a shortage of freight cars and fuel supply rather than a curtailment of output on the part of the mills. It also is pointed out by leading purchasing agents that there is very little duplication between the Government wants and the wants of the motor industry in steel. The Government requirements are very largely ship-plating of heavy gage and armament plating. The materials for heavy shells are also, of course, a great demand of the Government.

Chicago, Sept. 25—Motor car manufacturers in the middle west expect little benefit from the Government fixing of the price of steel. One manufacturer declares that the new prices of steel as fixed by the Government differ but little from the prices the motor car makers are paying for steel under contract. He says there is a wide discrepancy between the newspaper reports of present steel prices, and those being paid by the larger motor car concerns.

It seems to be the consensus that if the new prices can outlive present contracts, some of the manufacturers will benefit but the public at large will find little, if any change, in the price of motor cars for the coming year if the predictions of such companies as Nordyke & Marmon, Studebaker Corp., Nash Motors, Mitchell, Case and others in the middle west may be taken as a criterion. The accessory people look for little benefit immediately, but voice the opinion that it will help them in future.

Timing the Engine of a Ford

Easily Accomplished by Watching Marks on Camshaft Gears

By B. M. Ikert

THE Ford engine when it leaves the factory is correctly timed and this will be disturbed only when the gears on the crankshaft and camshaft are incorrectly meshed. This should not occur if proper attention is paid to the marks on the gear teeth. If the teeth are correctly set for the valves, the time of igniting the charge will also be correct, provided the mechanism in the timer case has not been disturbed.

When to Retime

It is only necessary to retime the engine after it has been taken down for new parts, such as push rods, crankshaft, timing gears, etc. Indications of an incorrectly timed engine are failure to start, blowing back through the carbureter, engine kicks back owing to spark which takes place before piston has reached top of the compression stroke. If the valves are set to open too late the engine may run, but the explosions will be feeble and accompanied by after explosions and misfiring. Overheating will follow these conditions frequently.

In the Ford engine there are but two gears to handle when timing it, and only one, the camshaft gear, has to be removed for the purpose. It is not necessary to actually take the gear from the camshaft, inasmuch as the whole camshaft assembly can be slipped towards the front of the engine so that the teeth of the cam gear will clear the small gear fastened to the crankshaft. Then by rotating the camshaft in this position it can be brought to the proper point and slipped back into position with the gears again in mesh. Sometimes when the Ford engine is tuned for speed work, the gears are meshed so that the intake valves open a little sooner, but in this case the engine will not throttle down and idle very well. As a general thing the factory marks should be followed, as an all-around result will be much better.

Position of Cylinders

The illustration on opposite page shows at a glance the position of the various parts in No. 1 cylinder—the one nearest the radiator—when the gears are correctly timed. It is easier to time the engine when the cylinder head is off, as then the position of the pistons and valves can be watched readily. After the cover of the timing gear case has been removed, turn the engine over so that piston No. 1 is flush with the top of the cylinder block. If the head is off this is easily done, otherwise it is necessary to look into the spark plug hole and watch the piston as it rises. In this position the piston will be $\frac{5}{16}$ in. from the top dead center. In other words it still has to travel that distance before it reaches its highest point and starts downward again.

Keep the engine in this position and you will note that there is a zero mark on the small crankshaft gear which is in line with the cranks or what corresponds to the line A-B in the diagram. Now pull out the camshaft and gear to free the teeth and rotate it until the zero mark comes directly opposite that on the smaller gear. When in this position the exhaust cam of No. 1 cylinder should point away from the marks. The exhaust valve, too, will be partially held open. All that remains is to slip the gears in place and the engine is correctly timed for the valves. It should be noted that cylinder No. 1 is not on the firing stroke when this adjustment is made. Number 2 is firing in this case, with No. 1 on the exhaust stroke. The firing order of the Ford engine is 1-2-4-3.

To make sure that the ignition is timed right, the roller which makes contact with the segments in the timer case should be down and either on or near contact 2, depending on whether the spark is in the retarded or advanced position. The engine is timed so that the exhaust valve closes when the piston is on top dead center. If in the diagram, the crankshaft is revolved in the direction shown, the piston will move to the top and at the same time the camshaft moves counter-clockwise so that the exhaust cam moves towards the left and allows the valve to close. The exhaust valve opens when the piston reaches $\frac{5}{16}$ in. before bottom center, the distance from the top of the piston head to the top of the cylinder block being $3\frac{3}{8}$ in. The intake valve opens $\frac{1}{16}$ in. after top center and closes $\frac{5}{16}$ in. after bottom center, the distance from the piston to the top of the cylinder casting in this case being $3\frac{1}{8}$ in. Following is the relation of the various cylinders to one another when the engine is running:

No adjustable push rods are fitted on the Ford engine, hence the proper clearance between the valve stems and push rods is secured by filing the ends of the stems, in case they are too long. The clearance should never be less than $\frac{1}{64}$ in. nor greater than $\frac{1}{32}$ in. The best position lies half way between these and a good way to get it correct for each stem is to insert a gage having the desired thickness between them when the valves are closed and the push rod lies on the heel of the cam. If anything, the exhaust valves can be given a slightly larger clearance, because they are subjected to greater heat and the stems may lengthen more than the intakes.

To Check Timing

A quick way to check up the ignition timing is to turn the engine over with the plugs removed and bring cylinder No. 1 to top compressio . center, allowing the piston to travel about $\frac{1}{8}$ in. farther on the down stroke. Place the spark lever on the steering wheel in the extreme retarded position, or at the top of the quadrant. Now remove the timer cover and if the roller makes contact with No. 1 segment, the engine is timed right.

Sometimes Ford engines are fitted with different types of ignition systems by the owners, using such systems as the Atwater Kent, Rhodes or Connecticut. The timing of these battery systems is a comparatively simple matter and the general mode of procedure is as follows:

When No. 1 is	No. 2 is	No. 3 is	N. 4 is
FIRING	Compres'n	Suction	Exhaust
Exhaust	FIRING	Compres'n	Suction
Suction	Exhaust	FIRING	Compres'n
Compres'n	Suction	Exhaust	FIRING

Construction of Systems

Usually the systems consist of a combination timer and distributer mounted on a vertical shaft driven by bevel gears from the camshaft. To time it the distributer head is slipped on the shaft without tightening the set screws on the hub at the bottom. The control rod is attached to the distributer and put in the extreme retarded position at the same time bringing piston of No. 1 cylinder to top compression center. The hub of the instrument is now rotated in its normal direction until a slight click is heard which indicates that the platinum points are separating. When this is heard, the movement is stopped and the position of the distributer block noted. If it is so placed that it makes contact with No. 1 terminal or segment inside of the distributer housing, it is correct and the set screws on the hub can be tightened so that it will rotate with the engine. If, when the click is heard, the distrib ter is not on segment No. 1 the hub is kept turning until No. 1 is reached. The rest of the cylinders will be automatically timed correctly if the first one is right.

KISSELKAR SPECIAL FOR SILVER

New York, Sept. 22—C. T. Silver has added to his line, recently increased by the special Silver-Apperson eight made for him by the Apperson Bros., Kokomo, Ind., a Kissel line of cars which will be changed into Kisselkar—Silver Specials. The changes involve the use of a new radiator, hood, cowl ventilator, windshield, top, head and tail lamps of the Silver bullet type, wire wheels, cord tires, rear spindle, gasoline tank, upholstery, binding, etc. A new line of specially designed and equipped closed and open models will be launched at the New York show in January. Mr. Silver also will handle the complete line of Kissel commercial wagons and trucks.

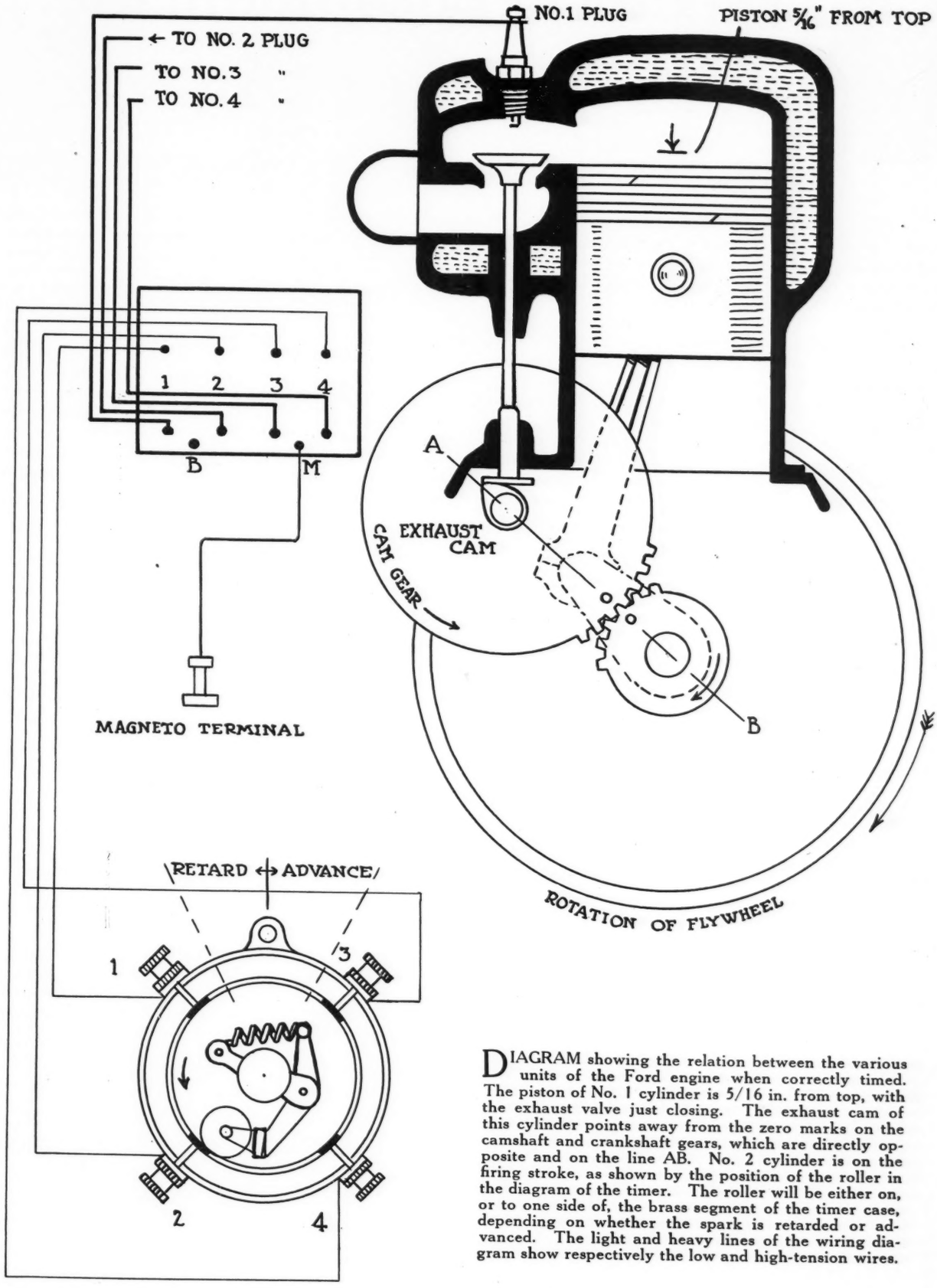
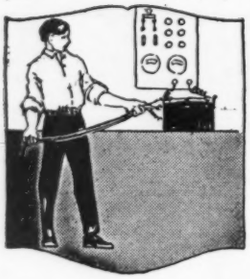
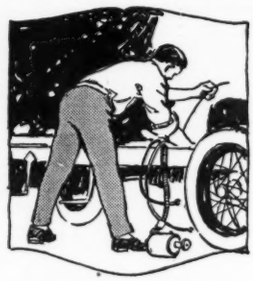


DIAGRAM showing the relation between the various units of the Ford engine when correctly timed. The piston of No. 1 cylinder is 5/16 in. from top, with the exhaust valve just closing. The exhaust cam of this cylinder points away from the zero marks on the camshaft and crankshaft gears, which are directly opposite and on the line AB. No. 2 cylinder is on the firing stroke, as shown by the position of the roller in the diagram of the timer. The roller will be either on, or to one side of, the brass segment of the timer case, depending on whether the spark is retarded or advanced. The light and heavy lines of the wiring diagram show respectively the low and high-tension wires.



Electrical Equipment of the Motor Car



By David Penn Moreton & Darwin S. Hatch.

Editor's Note—Herewith is presented the sixty-second installment of a weekly series of articles begun in MOTOR AGE *issue of June 29, 1916, designed to give the motorist the knowledge necessary to enable him to care for and repair any and all of the electrical features of his car, no matter what make or model it may be. At the conclusion of this series, "Electrical Equipment of the Motor Car," with additions, will be published in book form by the U. P. C. Book Co., Inc., New York, in a size to fit the pocket conveniently.*

The fundamentals of electrical circuits of the motor car were explained through their analogy to water systems, and the relations of current pressure and resistance were brought out. This was followed by an explanation of series and multiple circuits, how electricity is made to do work in lighting, starting, signalling, etc. Calculating the capacity of a battery for starting and lighting and the cost of charging storage batteries and determining the torque a starting motor must develop were explained. Action of primary batteries and dry cells was considered. A section was devoted to the makeup and action of lead and Edison storage batteries, and another to the care of lead batteries in service and the best methods of charging them. Magnets and electromagnetism then were considered, and the principles of generators and motors explained. A section on generator output was followed by one on the purpose and operation of the cutout. Electric motors and engine and motor connections then were considered. Ignition was taken up next.

Part LXII—Battery Ignition Systems

THE Bosch battery ignition system consists of a combination breaker and distributor and a combined switch and coil, the latter being mounted on the dash so that the switch is within easy reach of the driver. The complete system is shown in Fig. 339. The breaker mechanism is shown in Fig. 340. Rotation of the cam C causes the arm carrying the movable contact to move in such a manner as to open the circuit. The contacts are held closed by a spring, except when the projections on the cam are under the fiber block attached to the arm.

The distributor mechanism is mounted directly over the breaker and is quite simple. It consists of the customary cover, with the terminals molded in place. A radial arm carries a carbon brush, which makes a wiping contact with the various terminals for the wires leading to the different spark plugs. A cross-section of the combined breaker and distributor is shown in Fig. 341, and an exterior view is shown in Fig. 342.

The switch is so arranged that a magneto may be used, and the engine will run on the magneto with the switch in one position and on the battery with the switch in the other position. A vibrator attachment is incorporated with the switch to facilitate starting the engine when it is cold or the carbureter is out of adjustment. This vibrator mechanism is controlled by a pointed button in the center of the switch plug. Under normal starting conditions momentary pressure on the button will produce a single spark at the plug if the distributor brush is making contact with one of the distributor terminals. Turning the button to the right and depressing it makes the necessary connection to provide a stream of sparks at the different plugs, depending on the position of the distributor arm. If desired, the button can be locked in this position until the motor has started.

There is only one adjustment, and this is for the gap at the contacts. With the fiber block attached to the movable arm resting on the top of one of the projections on the cam, the contacts should be separated about .01 inch. To alter the adjustment the lock unit holding the stationary contact must be released first, and then carefully secured after the adjustment is made.

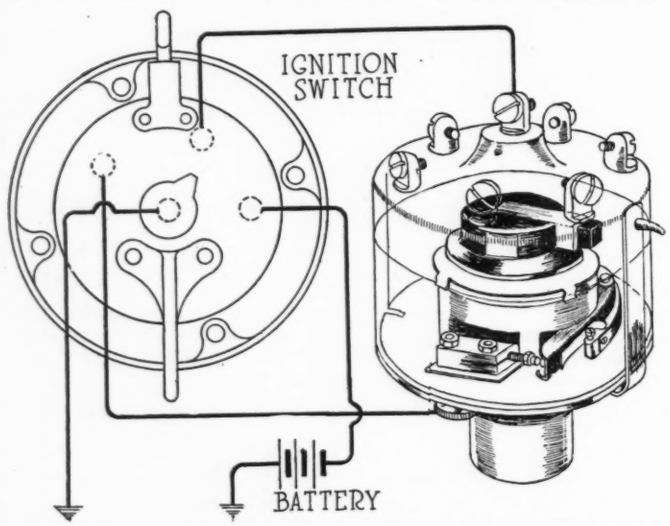


Fig. 339—Complete Bosch battery ignition system, including combination breaker and distributor and combined switch and coil

Connecticut System

The Connecticut system operates on the closed-circuit principle and is made for four-, six- and eight-cylinder engines. The complete system is shown in Fig. 343. The breaker mechanism

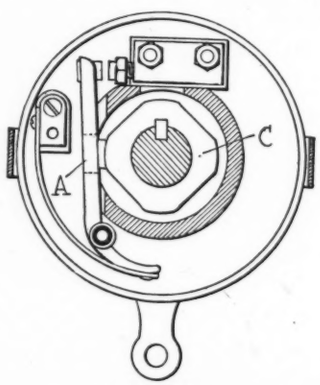


Fig. 340—Breaker mechanism of Bosch system

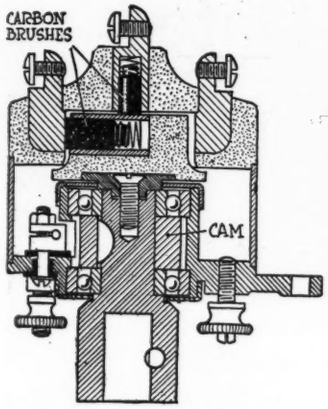


Fig. 341—Cross-section of Bosch combined breaker and distributor

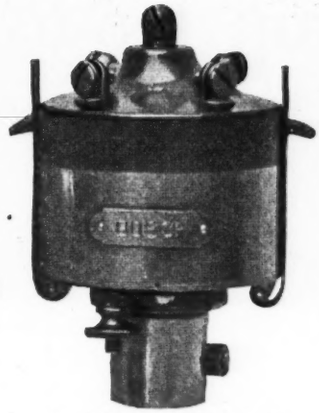


Fig. 342—Exterior view of Bosch combined breaker and distributor

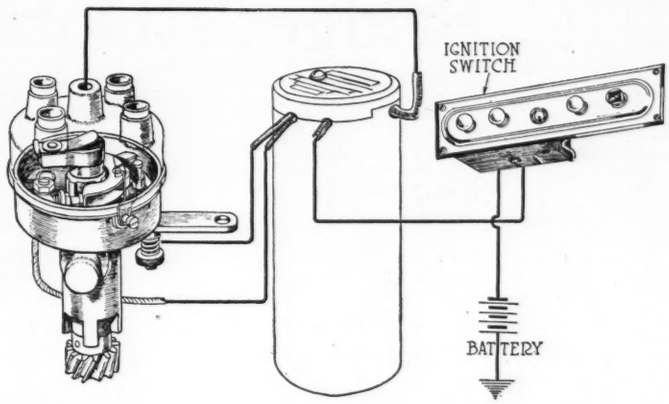


Fig. 343—Complete Connecticut battery ignition system, which operates on the closed-circuit principle

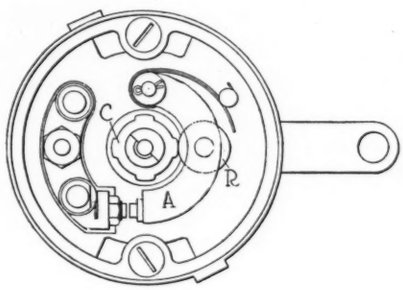


Fig. 344—Breaker mechanism of Connecticut ignition system

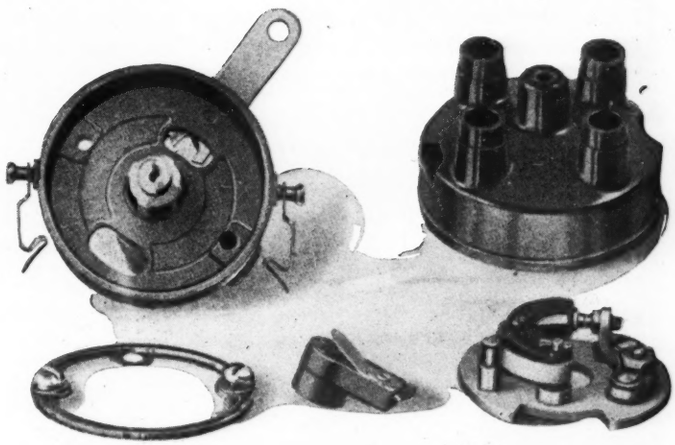


Fig. 345—Various parts of combined breaker and distributor of Connecticut system

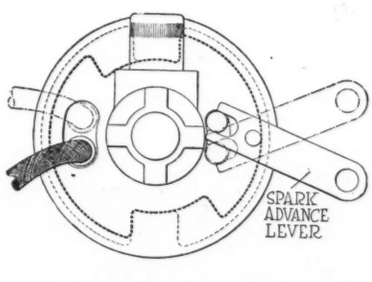


Fig. 348—Operation of spark advance lever on Connecticut

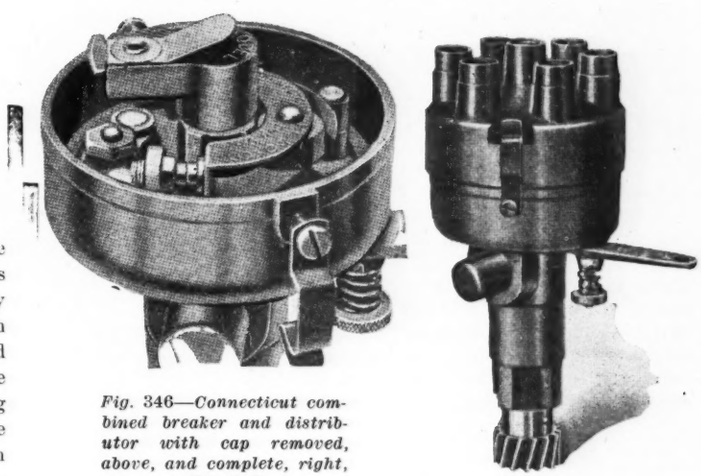


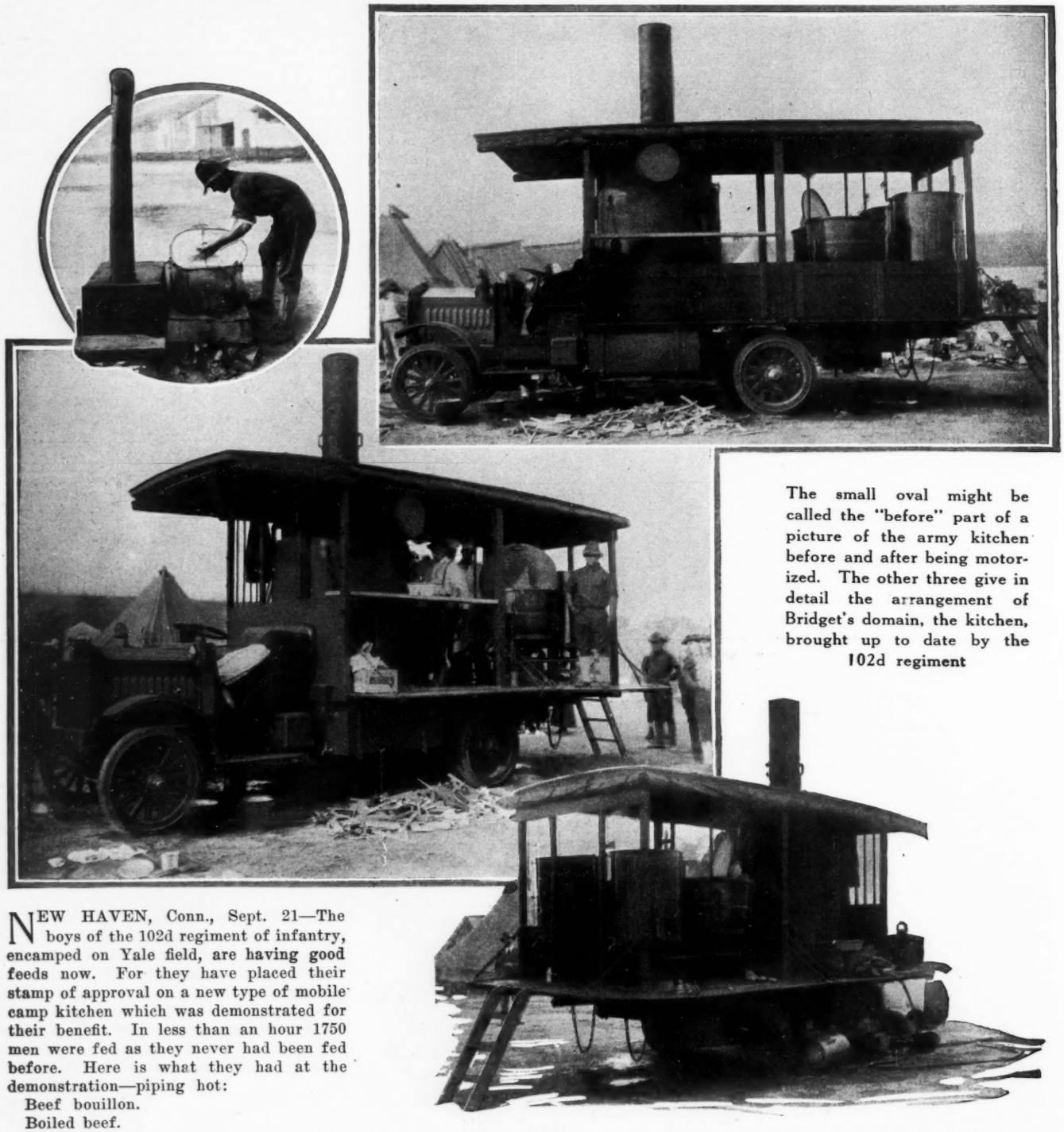
Fig. 346—Connecticut combined breaker and distributor with cap removed, above, and complete, right, Fig. 347

is shown in Fig. 344. As the cam C rotates the high parts come into contact with the roller R in the arm A, and thus separates the contacts. The arm A is returned to its normal position by a spring. The breaker mechanism is mounted on a plate which rests in the casing and is held in place by a spring ring and solid ring, the latter being held by two screws. The advance lever engages a stud on the breaker plate, the whole plate being advanced around the shaft to advance the time of ignition. The various parts of the combined breaker and distributor are shown in Fig. 345. The complete device with the distributor cap removed is shown in Fig. 346, and complete with the cap in position in Fig. 347. The operation of the advance lever in bringing about a proper timing is shown in Fig. 348.

A very ingenious device is provided to prevent the possibility of the battery being exhausted, due to the ignition switch being left closed and the engine stopped. This device is a small thermostat connected in series with the primary circuit, which controls a mechanism similar to that in an ordinary door bell. If the engine happens to be stopped with the ignition switch closed, the primary current in passing through the thermostat heats it, thereby bending it and closing a circuit through a buzzer mechanism. This in turn automatically opens the switch. The action of the thermostat can be set for anything from 30 seconds to 4 minutes, the normal setting being about three-quarters of a minute.

In the latest designs a spark gap has been provided between the distributor brush and the contacts instead of a wipe contact. To prevent oxidization the cover is ventilated through two tiny holes so as not to decrease the weatherproof properties of the instrument. Rotation of the distributor arm acts to keep the housing well ventilated. The wiring to the coil is so arranged through the use of a hexagonal terminal that it is impossible to put a wire on the wrong connection.

Bridget's Domain Up-to-Date



The small oval might be called the "before" part of a picture of the army kitchen before and after being motorized. The other three give in detail the arrangement of Bridget's domain, the kitchen, brought up to date by the 102d regiment

NEW HAVEN, Conn., Sept. 21—The boys of the 102d regiment of infantry, encamped on Yale field, are having good feeds now. For they have placed their stamp of approval on a new type of mobile camp kitchen which was demonstrated for their benefit. In less than an hour 1750 men were fed as they never had been fed before. Here is what they had at the demonstration—piping hot:

Beef bouillon.
Boiled beef.
Army beans.
Coffee.

The reason they got it so quickly and so hot was the Taft Army Field Kitchen, the invention of J. C. La Vin, manager of the Hotel Taft, who, with C. M. Bradford of the Bradford Auto Sales Co. and H. D. Baldwin, perfected the kitchen and put it on wheels.

The kitchen can serve three meals a day to 2000 men. It can serve hot coffee to 1000 men every 10 min. Probably it is the first successful steam cooking unit on wheels; and by its use two cooks replace forty; one kitchen takes the place of twenty company kitchen units, which require forty horses and eighty men for operation.

The complete kitchen consists of a 10-hp. steam boiler, two 90-gal. stew, soup or pot roast kettles, and two 50-gal. coffee urns. The boiler is a vertical, fire-tube type and burns coal, wood or oil. Yesterday it burned wood.

The kettles and urns are special steam-jacketed types designed for quick boiling. They will raise water from 62 deg. Fahr. to 212 deg. Fahr. in 6 min. Generally, however, water at about 190 deg. is fed into them from the Penberthy injector which feeds the boiler, thereby materially reducing the time required for boiling.

In the test, with one coffee urn empty, 50 gal. of excellent coffee were ready in 9 min. by stop-watch.

The steam pressure varies from 40 to 50 lb. In addition to being used for cooking, it also can be used for sterilizing mess tins; and it would be a simple matter to use a small part of the live steam for sterilizing surgical dressings and instruments.

The whole cooking unit is mounted on a

standard 4-ton Riker chassis. What body there is, consisting merely of a roof and flareboards which drop down to serve as platforms, is light. The entire unit probably weighs between 8 and 9 tons. It is capable of a road speed of 15 m.p.h. under favorable conditions.

The unit is designed to go with, or ahead of, a battalion on the march. Meals are cooked on the road, and when the battalion halts hot food is ready. When a battalion entrains the kitchen is put on a flat car and goes right on cooking. It is planned to add a 6 K. W. generator to be operated by the truck engine. This would furnish current for officers' tents, for a searchlight and to operate field wireless apparatus. The truck is a complete kitchen unit.

Routes and Touring Information

MOTOR AGE outlines route itineraries for its readers by letter. Each week only a few of the routes asked for are published, these being those of more general interest. In asking MOTOR AGE for routes, write your name and address distinctly on a return envelope.

Oklahoma to Chicago

Guthrie, Okla.—Editor MOTOR AGE—Give a route from here to Chicago.—E. D.

Follow the National Old Trails from Kansas City to St. Louis, then follow the Burlington Way to Chicago. You will find this route outlined on map which accompanied our Touring Issue of April 5; also on map appearing in our issue of July 5, page 29. Individual maps of these trails may be obtained by addressing Frank A. Davis, secretary, National Old Trails Association, 322 Railway Exchange building, Kansas City, Mo., and A. E. Nissen, secretary, Burlington Way, Iowa City, Iowa.

Vol. 5 of the Automobile Blue Books, published at 910 South Michigan avenue, Chicago, contains complete running directions for the trip.

Lynchburg, Va.-New York

From Lynchburg, go to Snowden, Glasgow, Natural Bridge Station, Natural Bridge, Fancy Hill, Lexington, Timber Ridge, Fairfield, Midway, Greenville, Minte Springs, Staunton, Rolla, Mount Sidney, Burketown, Mount Crawford, Harrisonburg, Lacey Springs, New Market, Mount Jackson, Edinburg, Woodstock, Maurertown, Toms Brook, Strasburg, Middletown, Stephens City, Winchester, Buner Hill, W. Va., Darkesville, Martinsburg, Falling Water, Md., Williamsport, Md., Hagerstown. As most of this route is over toll roads, several dollars in fees will have to be paid before reaching Hagerstown. From Hagerstown, go to Leitersburg, Waynesboro, Rouzerville, Blue Ridge Summit, Chairman, Fairfield, Gettysburg. From the latter point, follow the Lincoln Highway through Lancaster, Philadelphia, Trenton, Princeton, New Brunswick, Newark, to New York.

Vols. 6 and 3 of the Automobile Blue Books contains complete running directions.

Sioux City, Iowa,—El Paso, Tex.

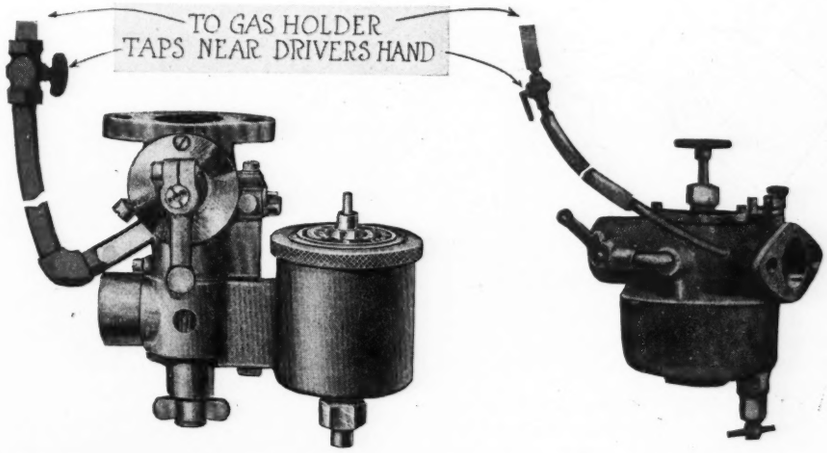
Sioux City, Iowa—Editor MOTOR AGE—Give me the best route from here to El Paso.—H. E. Johnsen.

There are several routes from your city to El Paso, and as most of the roads you will encounter are of natural dirt, conditions would be about the same on the whole. One way would be to follow the Meridian road to Omaha, then take the Lincoln highway to Cheyenne, thence go south to Pueblo, from where the National Old Trail may be followed as far as Socorro, N. M. Then proceed to El Paso via San Antonio, San Marcial, Milligan, Elephant Butte Dam, Engle, Cutter, Selden Hot Springs, Las Cruces and Mesilla Park.

Another route proceeds through Omaha, Nebraska City, Hiawatha, Topeka, Osage City, Emporia, Florence, Newton, Hutchinson, Sylvia, Turon, Haviland, Greensburg, Buckling, Bloom, Fowler, Stratford, Amarillo, Santa Rosa, Roswell, Alamogordo to El Paso.

Vol. 7 of the Automobile Blue Book contains complete running directions.

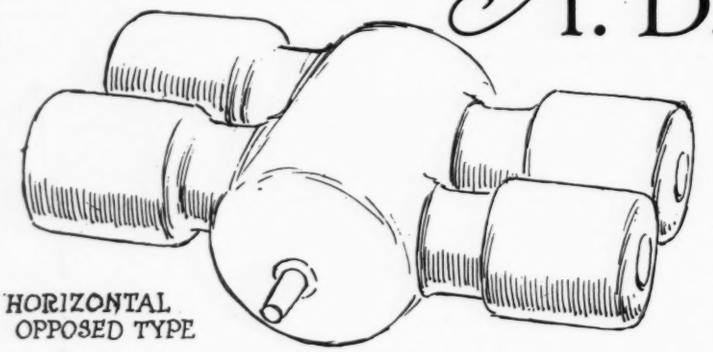
How London Fixes Motor Cars to Use Coal Gas Fuel



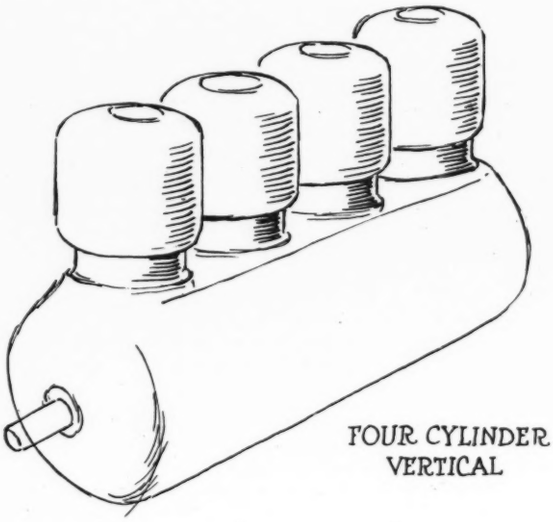
LONDON, England, Sept. 1—The London buses are not the only motor vehicles making use of coal gas as motive power, however universal that impression may be. The new motor car fuel is used on all kinds of vehicles, from the many seated motor buses down to the Ford car. Some of the gas holders are very ungainly in appearance, while on the other hand some of the gas-container makers turn out a fairly sightly container.

The one illustrated here is for a Ford car and in the smaller picture is shown the method of connecting the gas holder with the carbureter, the one at the right being that on the Ford and at the left, a Zenith. The holders in most cases are cylindrical in shape and are made not for pressure but merely to be filled with gas. Capacity ranges from those of 5 ft. and on up, the smallest containing 20 cu. ft. of the gas only. Gasoline connections are unharmed.

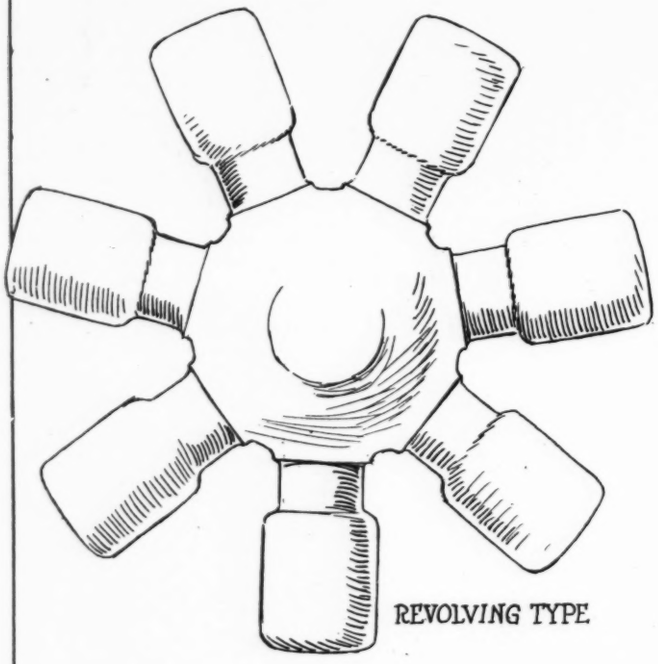
A. B. C. of Aviation



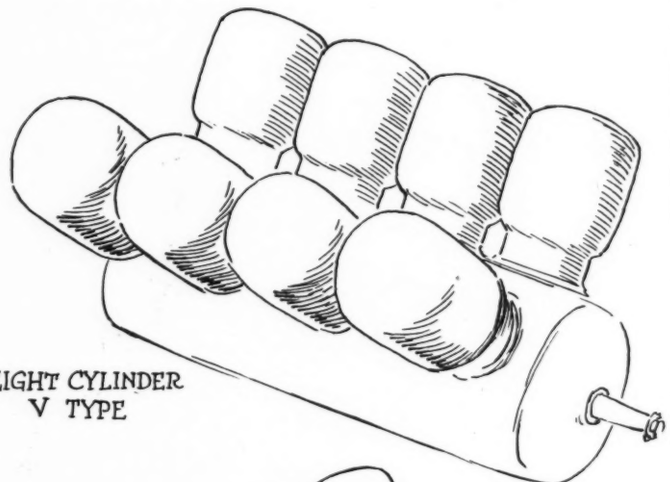
HORIZONTAL OPPOSED TYPE



FOUR CYLINDER VERTICAL

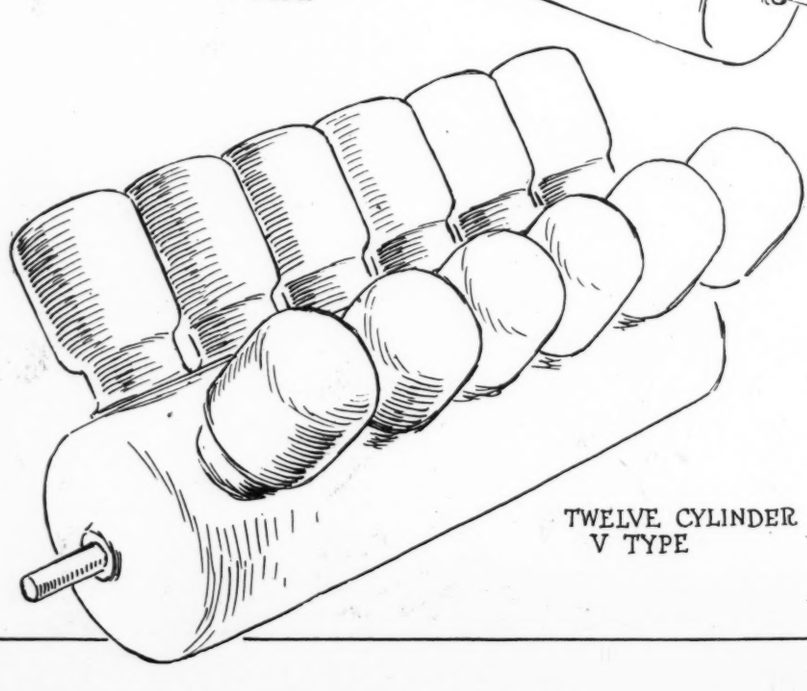


REVOLVING TYPE



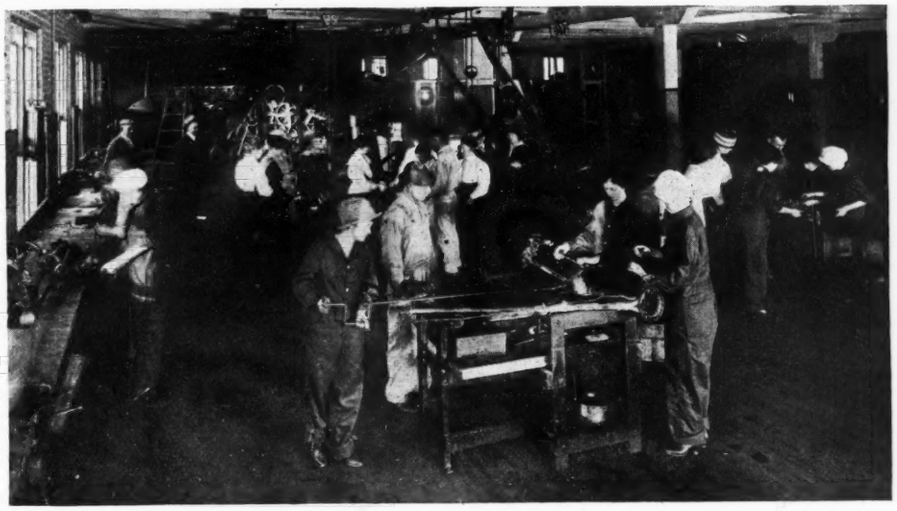
EIGHT CYLINDER V TYPE

CYLINDER arrangements in airplane practice. Upper left-hand illustration shows the horizontal-opposed type having four cylinders. This is also made with as many as twelve cylinders, of which the Ashmusen engine is an example. To the right is a four-cylinder vertical engine; the six-cylinder vertical is essentially the same with the exception that two more cylinders are set in line with the others. The Duesenberg, Hall-Scott and Union Six are typical American engines of the vertical kind. Revolving engines are those in which the crankshaft is stationary and the crankcase and cylinders revolve around it. The Gnome and Anzani are revolving engines. The two lower illustrations show an eight- and twelve-cylinder of the V-type such as the Wisconsin, Sturtevant, Curtiss and Packard. Details have been omitted in these sketches to prevent confusion and they are intended merely to show the types.



TWELVE CYLINDER V TYPE

American Women and War



Two classes of twenty women each were being taught by the Hubb Digg Co., dealer at Fort Worth, Tex., when this picture was taken. Since then, the company has filled the places of enlisted men with some of them

THE women of the United States are learning the mechanism of the car with a thoroughness such as could not be surpassed were they to know they would be called into service tomorrow. Dealers throughout the country have joined in the new era of education, and several classes have been graduated.

In the west this intensive study of the interior of the car has not been taken up to such extent, though it is known widely that the women of the west more often than not drive their own cars. California has perhaps the largest proportion of women who drive. Utah has almost as many women drivers as registrations, it is claimed. While all the western states, especially those of the coast, are known for the initiative of their women in motoring.

The west says the woman decides the tour. Why go on a long tour if you must go alone? And so on. So also they say why have a car if it is one the woman of the family cannot drive while you are busy in your office, riding a horse over the plowed field or tied up in a business conference? It is these conditions that have made the movement toward learning the car more gradual and less intensified than among the women of the east and middle west. The women of the west are for the most part drivers who have learned to drive on the dirt road where more or less ingenuity is required, and she too is as ready as her sister of the large cities of the east.

It is the special representative of Queen Marie of Rumania to America who is accredited with the following admonition:

"Every woman in the United States should learn to drive a motor car. This may sound like a broad statement, but it will bear analysis. You have something like 4,000,000 cars in this country. This is an ample number with which to teach women how to operate them.

"Why should they learn? You will find the answer in Europe. America must wake up to a realization of what the war means. The time may come when American women will have to do what the women of Europe have done—replace men.

"The women of France, the women of England, the women of Belgium and the women of Rumania have laid aside the feminine prerogative of staying at home and minding babies to relieve men who are able to shoulder a gun and fight for liberty.

"To my mind one of the chief occupations of women today is the handling of ambulances, as well as nursing the sick. I have seen women ambulance drivers enter the shell-riven trenches, calmly gather up the wounded and then drive them to safety through a storm of bursting bombs and never turn a hair."

Both men and women once pooh-poohed the idea that the United States ever would be in the war. The United States is in. They pooh-poohed the idea that women of the United States ever would be needed to fill the places of men taken to fill the ranks of the army. They are needed. Motor driving is one of the most versatile occupations today. Women will do their part in this also.

Why the U. S. Is Fighting Waste

One-Half Cup of Milk

Half a cup of milk—whole, skimmed or sour—a seemingly trifling matter—hardly worth the trouble to keep or use.

In many households quite a little milk is wasted, left uncovered in glasses, regarded as useless because the cream has been skimmed off, allowed to sour, poured down the sink or thrown out.

If every home—there are 20,000,000 of them—should waste on the average half a cup daily, it would mean a waste of 2,500,000 qt. daily—912,500,000 qt. a year—the total product of more than 400,000 cows.

It takes a lot of grass and grain to make that much milk, and an army of people to produce and deliver it.

Every household does not waste half a cup of milk a day. Well, say half a cup is wasted in only one out of 100 homes. Still intolerable, when milk is so nutritious, when skim milk can be used in making nutritious soups and cereal dishes, when sour milk can be used in bread-making or for cottage cheese.

FOOD SAVED ALREADY

The University Club of Chicago is saving a ton of flour and 2 tons of meat a month through voluntary food conservation. The announcement goes with the roll of honor of those who have joined the armed forces. The house committee quotes some monthly savings as: Potatoes, 30 bu.; poultry, 356 lb.; meat, 4027 lb.; flour, 1950 lb. In addition are the economies in sugar, butter, eggs, milk and cream, lard and so on. Tuesday is a meatless day for members and employees. Potatoes are not served as a side dish with entrees. Only one vegetable is used as a garnish. Pork and bacon have been eliminated as garnishes for other meats, and the serving of baby lamb, veal, suckling pig and squabs has been discontinued altogether. Cinnamon rolls, coffee cake and French bread have been discontinued, and cornbread is substituted for rolls.

The Readers' Clearing House

The Electric System

Too High Voltage for Lights

Q—What is the proper way of changing the wires of Ruthardt high tension magneto for lighting motor?—S. K. Horinchi, Pasadena, Cal.

It is impossible to use a high-tension magneto for any other purpose than ignition. The voltage from such a magnet is anywhere from 10,000 volts up and if this current is sent into a lighting circuit which operates normally at about 6 volts, obviously the lights will immediately be burned out.

Connecting North-East Cut-Out

Q.—Show a sketch advising how to connect the two wires to a North East generator cut-out, as shown in sketch.—Louis Armand, Trout, La.

You have neglected to tell us the type or model of equipment you are using, or make of car. The sketch also is rather vague, particularly in that one of the wires does not seem to be connected at either end. The general appearance of the sketch seems to indicate that you are using the cut-out with one of the model D starter-generators of this system. A wiring diagram of this showing how the cut-out is connected is shown in Fig. 1. Assuming that this is the machine you have, it is probable that the two wires should be connected, one to the top of the limiting or regulating relay which is mounted directly at the side of the cut-out, and the other to binding post A at the base of the relay unit. This binding post is the one that is connected to the starter-generator by a red lead.

May be Wrong Gap on Coil

Q.—Explain my ignition Delco head mounted on Atwater Kent Ford Standard K2 bracket, the job being mechanically correct. Delco has 16 deg. automatic advance; coil standard Delco; current, dry cells, 20 amp. test and better; spark gap at coil shows no miss at any speed; gaps on plugs all set $\frac{1}{4}$ in. show very stringy at high speed 2000 r.p.m. and up, resulting in usually two cylinders missing. Everything new, spark plug gaps $\frac{1}{4}$ in., breaker set according to spacer sent with equipment, primary voltage correct. Have also tried storage battery, high tension wires clear of everything and separated from one another. Have tried different coil with no better results. Can you suggest anything to help me?—E. B. Workman, Woodward, Okla.

We would suggest that you investigate the following parts in connection with your trouble.

Are you sure that the spark gap at the coil is not so set that it robs the various gaps at the plugs? Is the distributer properly adjusted in relation to the breaker for the entire 16 deg. advance of the spark? Have you weakened the spring controlling the breaker arm so that the time for it to reseat the movable contact has been decreased? Check up on these points and we believe you may possibly find a solution to your trouble.

Varied Electric Questions

Q.—Why are Edison batteries used so little on machines compared with other makes?
2—What kind of current does the common generator develop, A. C. or D. C.? Which is the more powerful—A. C. or D. C.—current of the same amperage?
3—How may one tell a positive from a negative wire?
4—What is a shunt field and its functions?
5—What is a series field and its functions?
6—What distance will the starter motor run the Overland 54 without harm to the storage batteries? Will this harm the engine or motor?
7—Should a small amount of water splashed on the generator, motor or distributer harm them to any extent?—Walter Bromley, Spokane, Wash.

1—Edison batteries are not much used on motor cars for the reason that they are not well adapted to deliver the exceedingly heavy current required for starting.

2—If you mean the common motor car generator, it develops a direct current. You can get any amount of power with both an alternating and a direct current. The power depends not only on the amperage but also on the voltage. If both the amperage and the voltage are the same the power is generally slightly more with direct current, for the reason that in an alternating current circuit in which both the voltage and the amperage increase to a maximum, then decrease to zero and increase to negative maximum and then decrease to zero again, the amperes and volts, as a rule, do not reach their maxima at the same time, but are slightly out of phase. If they are in phase, then the power in an alternating circuit is the same as that in the direct current circuit of the same amperage and voltage.

3—In order to tell a positive from a negative wire, bare the ends of the wires and dip them into slightly acidulated or salted water. Then, if the current is turned on, you will see gas bubbles accumulating on the ends of both wires and rising therefrom, and the wire from which the greatest amount of gas rises is the negative one.

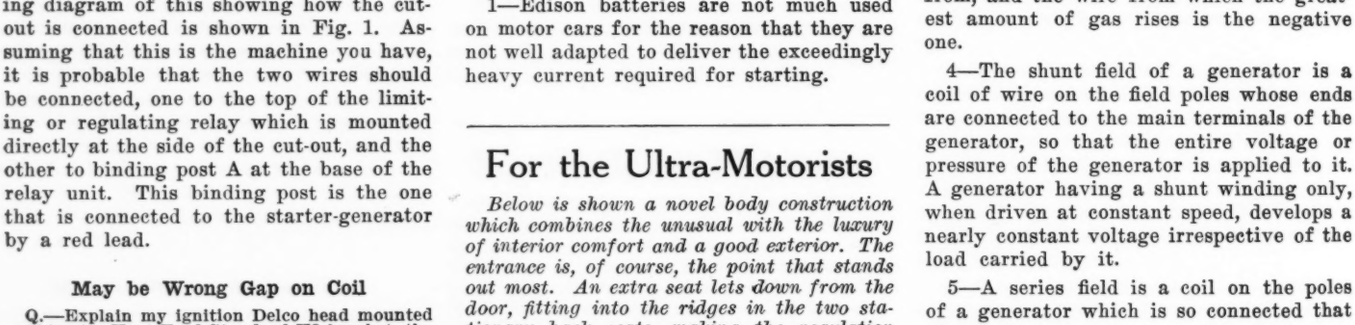
4—The shunt field of a generator is a coil of wire on the field poles whose ends are connected to the main terminals of the generator, so that the entire voltage or pressure of the generator is applied to it. A generator having a shunt winding only, when driven at constant speed, develops a nearly constant voltage irrespective of the load carried by it.

5—A series field is a coil on the poles of a generator which is so connected that all of the current generated must pass through it. Evidently the strength of this field increases with the load on the generator. A series field is used mainly for motors, its object being to give a high starting torque. When the current is first switched on to the motor an enormous current will flow through it, which will make the field very strong and thus produce a high starting effort.

6—A starter motor will not run a car

For the Ultra-Motorists

Below is shown a novel body construction which combines the unusual with the luxury of interior comfort and a good exterior. The entrance is, of course, the point that stands out most. An extra seat lets down from the door, fitting into the ridges in the two stationary back seats, making the regulation back seat when desired. As there is no side door, the fenders are eliminated, the design being concentrated on the arrangement of the tonneau, seating arrangements, etc., and in the general lines of the body. It is essentially a car for the owner who drives, as the design gives that feeling of privacy and togetherness—if there is such a word—that the sedan offers to a certain extent. Privacy is emphasized here by the exclusion of even a second door. Kenworthy of MOTOR AGE is the designer of it. This is one of a series.



any distance without injuring the storage battery. Of course, the storage battery will not be put out of business immediately if a car is started on the electric starter, but it will receive permanent injury which, if the practice is repeated, will cause it to depreciate quickly. No harm will be done the engine by this practice, but the motor may possibly be overloaded and burned out.

7—As the average generator or motor is completely inclosed a small amount of water splashed on it will not hurt it. The distributer would be most easily affected if water should get into it, as it carries high tension current, which will escape through any leakage path that may offer.

Miscellaneous

1916 Ford Engine Knocks

Q.—My 1916 Ford has a very annoying knock. When driving 15 or 20 m.p.h. on a hill or on level, one can't hear it, but if the clutch is thrown out and the throttle closed quickly, it knocks for half a minute or so, and then stops. If I drive 8 or 10 m.p.h., then throw out clutch and close throttle, one cannot hear the knock at all. It is much worse when the motor gets warmed up. The rod-bearings are all tight. Can you tell what the trouble is?—C. E. Frost, Hopkins, Mich.

Your trouble might be caused by preignition, caused by excessive carbon deposit, loose piston pin or worn cylinder. The carbon knock is much more noticeable when the engine is warm. If you suspect the pistons test them out by removing the spark plugs and pour in a little heavy oil in each cylinder. Now crank the engine slowly for some time to give the oil a chance to get into the piston rings. Replace the plugs and start the engine. If the knock ceases, it is due to the heavy oil which acts as a cushion between the cylinder and piston, showing that there is excessive wear. You do not state how many miles your car has been driven, which naturally would have something to do with the wear of the parts.

Simplex Oiling Explained

Q.—What kind of oiling system is used on the Simplex 38, 1914 model?—E. Paul Dupont, Wilmington, Del.

Crankshaft bearings, connecting rod bearings, and all parts within the crankcase and cylinders are oiled directly or indirectly by a force-feed system. The oil is filled through the breather located between the cylinders and the level observed in the sight glass back of the water pump. There is a device for adjusting the flow of oil located on the right side of the engine base, near the steering gear. Oil is pumped from the crankcase oil reservoir by the oil pump and distributed to the main bearings by ducts. Other bearings are fed by overflow ducts and splash. In adjusting the oil flow the long hexagonal plugs on the side of the engine are removed and the flow observed. There should be 10 drops of oil fed per minute when the engine is idling. The adjustment is made by removing the locknuts on top and raising or lowering the needle valves. The front needle valve regulates the flow of oil to the front crankshaft bearing, the middle one to the middle bearing and the rear to the rear. About ½ pint of oil is kept in the compartment in front of the engine for oiling the timing gears. There is a hexagonal plug on top of the compartment at the left for filling this. The oil cups placed along the camshaft should be filled with cylinder oil before starting the engine after long disuse.

TO assist readers in obtaining as a unit all information contained in this department on a certain subject in which they may be most interested, such as ignition, carburetion, etc., MOTOR AGE has inaugurated the segregation of inquiries into classes of allied nature. Questions pertaining to cooling will be answered under that head and so on.

THE ELECTRIC SYSTEM

S. K. Horinchi.....Pasadena, Cal.
Louis Armand.....Trout, La.
E. B. Workman.....Woodward, Okla.
Walter Bromley.....Spokane, Wash.

MISCELLANEOUS

Weiley H. Brown.....London, Ky.
E. Paul Dupont.....Wilmington, Del.
Walter Bromley.....Spokane, Wash.
Neal Dudley.....Los Angeles, Cal.
B. D. Sutherland.....Brooklyn, N. Y.
Albert Fountain.....Circle, Mont.

REBUILDING

C. A. Colville.....Kayenta, Ariz.
Alwain Arum.....Minneapolis, Minn.
E. O. Skogerson.....Northfield, Minn.
H. C. Meng.....Chicago
Albert Oldham.....Winchester, Ky.

ENGINES

Clarence Mellem.....Binford, N. D.
Walter Bromley.....Spokane, Wash.
William B. Miller.....Galena, Kan.

No communication not signed by the writer's name and address will be answered in this department.

Valves for Marine Work

Q.—Are the valves the main factor in determining the difference in a marine engine turning 300 r.p.m. and a 15 cont. motor car engine turning 1500 r.p.m.? If not, what is the main factor?

2—What is the object of having four valves to a cylinder in place of two—the two having the same area as the four?—Walter Bromley, Spokane, Wash.

1—The sizes of the valves and the timing of same are the main difference between low speed marine and high speed motor car engines. Of course, there are other differences, as the reciprocating parts are generally a great deal heavier in low speed machines, and the structural parts are also somewhat heavier.

2—Large valves are difficult to keep cool, they are apt to warp and require a very strong spring in order to close them promptly. The use of the strong spring subjects the metal in the stem to severe stresses. For these reasons some designers prefer to use two valves, which will cool better, warp less and require a less powerful spring.

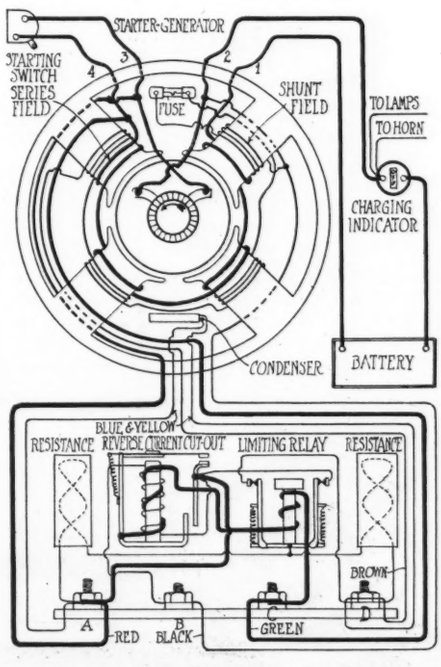


Fig. 1—Wiring diagram of North East cut-out connections

Plugs for Aviation Engines

Q.—What size spark plugs are commonly used in American aviation engines?—E. Paul Dupont, Wilmington, Del.

The 18 mm. plug was adopted by the Society of Automotive Engineers as standard for aeronautic work and the table of tolerances is as follows:

Dimensions of spark plug thread

Diameter	Maximum
	Mm. / In.
Outside	17.975 / 0.708
Pitch	17.001 / 0.669
Root	15.864 / 0.625
Diameter	**Minimum**
	Mm. / In.
Outside	17.850 / 0.703
Pitch	16.875 / 0.664
Root	15.739 / 0.620

Water in Crankcase

1—Should any water get into the crankcase, what effect would it have on the engine? Would it not soon be converted to steam and pass off while the engine was running?

2—Theoretically, which is the better—cone or disk clutch?—Walter Bromley, Spokane, Wash.

The oil in the average crankcase does not reach a temperature sufficiently high to evaporate the water. When the engine is at rest it would accumulate at the bottom of the oil sump, being heavier than the oil, and as the pump draws its supply from this point, water would be pumped to the bearings instead of oil, which would be highly objectionable.

2—Theoretically the cone and the disk clutch both perform their functions equally well.

Reader States Views on Driving

I have been engaged in the motor car business for the past 12 years and regard myself as competent to pass judgment on the faults of the average motor car owner. I maintain that the largest per cent of motor car owners are not good drivers. A good driver is, in my estimation, one who knows how to handle his, or her, car so as to get the maximum amount of pleasure and service out of it with minimum amount of trouble and expense to either themselves or the service department of the dealer whose car they are driving.

There must be some reason for this state of affairs. Is it that the owners themselves do not care, or that they are not intelligent enough to learn, if they are properly instructed at first, or what is the real reason? I think I have the answer which will apply in the majority of cases—and that is incompetent and careless instruction when they first buy a car.

The average motor car agency employs one or more young boys to instruct the

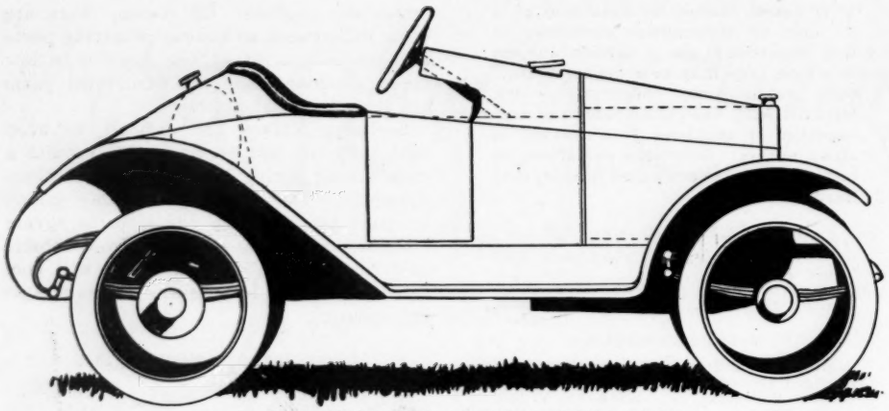


Fig. 4—Little 1913 roadster transformed into speedster

buyers of new cars how to operate them. Very often these boys do not know how to drive a car properly themselves, so how can they teach anyone else? In some agencies, a mechanic is sent out with a new owner. While he may be a good mechanic and possibly a good driver himself, he often times lacks that particular knack of being able to show the other fellow the right way—or else he is not interested enough to care whether the owner learns right or not, as long as he escapes from the shop for a few hours and gets a ride.

What is the quickest and easiest method of teaching a new owner how to operate his car right? Also what is the right way to handle a car—so as to get the best all around results at the least trouble and expense? I would like to know what the motor car owners themselves think about this question of careless and incompetent instruction. This is also a question which should interest the dealers and will be an investigation by their efficiency experts, as it touches their pocketbook through their service departments as well as the owner's.

Can we not hear more along this line from those interested through the pages of MOTOR AGE?—Neal Dudley, Los Angeles, Cal.

Shortening Intake Manifold

Q.—In a recent issue of MOTOR AGE you say that shortening of the intake manifold leaves less chance for condensation of the vapors. Do you mean the gasoline would form into small drops before reaching the cylinders?

2—Would the steam from the radiator injected to the intake manifold have all the merits claimed by some?—Walter Bromley, Spokane, Wash.

1—When the atmospheric temperature is low there is a tendency for the fuel discharged from the carbureter nozzle to condense and form small bubbles which will drop to the bottom of the carbureter and drain off. Some 10 years ago, when very much lighter fuel was used, the carbureters were generally placed low at the side of the engine, and the charge had to be raised by the suction of the cylinders to the level of the valves. When our present day gasoline is used in a car of this type, in starting by hand, when the suction is comparatively light, the small bubbles of fuel that form at the nozzle, will drop to the bottom of the carbureter and the mixture entering the engine will be so weak that it will not fire. Therefore, great difficulty is generally experienced in starting the engine in cold weather. To obviate this trouble the carbureters are now generally placed on a level with the intake valves, so that the gasoline does not have to be raised by the suction, but passes through a horizontal passage directly into the engine.

2—This is largely a matter of opinion. We have no data of scientific tests showing the effect of steam induction.

Lost Motion in Steering Gear

Q.—How can I take up the play in the steering wheel of a Chevrolet 1915 Baby Grand model? I have about 3 in. of play at the wheel, and the trouble seems to be at the end of the steering column. It is not in the balls and sockets.—B. D. Sutherland, Brooklyn, N. Y.

There is an adjusting nut at the top of the frame bracket which should be turned down to take up the play. If this does not remedy matters, it shows that the worm is worn. A way to overcome this is to remove the steering gear and take off the worm from the shaft and cut a keyway in it opposite the present one. Then replace the worm on the shaft in the new position. This presents a new surface to bear on the worm wheel and takes up the lost motion. If this has been already done the only recourse is to put in a new worm.

Rebuilding

Removing Clutch from Paige

Q.—How can I take down the clutch on a Fleetwood model Paige and give method of inserting new cork insert?—C. A. Colville, Kayenta, Ariz.

First remove the floor boards and disconnect the brake rods, both front brake and emergency, from the gearset. Next the propeller shaft can be dropped by disconnecting the two halves of the front universal joint.

You will note that there are four large cap screws holding the gearset, and when these are removed the gearset can be lifted away from the engine. This will expose the clutch housing and all that is necessary is to remove the cover and the disks can be taken out. Before taking the disks out, however, it is well to have two studs made about 5 in. long. These are to be $\frac{7}{8}$ in. in diameter and threaded for a distance of $\frac{3}{4}$ in. with 24 threads to the inch. The balance of the stud can be a U. S. S. thread and three U. S. S. nuts provided for each.

Remove two of the cap screws holding the clutch cover, just opposite each other, and insert the 24-thread ends of the studs and tighten them by using two of the nuts as jam nuts. The extra nut should be run down the studs until it is tight against the clutch cover. The rest of the cap screws can then be removed and as the nuts on the studs are backed away, the tension of the clutch spring will be removed gradually, and the cover can be removed. This operation is reversed when the clutch is re-assembled.

Recorking the disks necessitates the use of a special cork-inserting tool and could not be done by the average individual. It is best to return the disks to the factory service department.

Removing Overland Valve Tappets

Q.—How are the valve tappets removed on the Overland model 85-W? What is the proper way to put on new ones?

2—When putting in new pistons, is it necessary to lap them in? How is it done?—Alwin Arum, Minneapolis, Minn.

1—To remove the push rods or push rod guides it is necessary to first take out the valves from the cylinder block. To do this remove the nuts on the studs that hold down the cylinder head and take off the latter. Remove the valve cover plates and take out the valve springs. For this operation valve lifters may be applied, but in the event that they are not available, a screwdriver can be used as shown in Fig. 7. A good valve lifting tool may be made by flattening and forking the end of a ½-in. rod so that the fork bears on opposite sides of the valve spring cap. After the pin in the valve stem has been

Fig. 5—1912 five-passenger Overland after it has been rebuilt as a speedster

removed, the valve stem can be pushed up through the valve stem guide and so removed from the engine.

After the valves are removed, the push rods and push rod adjusting screws can be lifted from the push rod guides by first removing the castellated nut on the push rod guide clamp stud. Fig. 7 is shown the clamp that holds the push rod guides and when this is removed, the latter can be lifted out in pairs. To fit new push rods it is only necessary to place them in the guides in the same way as the old ones.

2—Lapping in a piston simply means to work into a good fit into the cylinder. In repair work it is customary to use an old cylinder to lap in piston and rings and not the one in which the piston will be finally fitted in the engine. But where pistons are just a little oversize, they can be lapped in their respective cylinders by using a mixture of powdered glass, kerosene and lubricating oil. Pumice stone and water can also be used. The lapping is done by fitting a wooden handle to the piston resembling a large connecting rod and then moving the piston to and fro in the cylinder, applying the lapping compound liberally. As the piston is worked in and out it should be rotated slightly at each stroke, which will insure a better job. The rings should be in position on the piston when this is done. When the latter are shiny all around, the job is finished and the whole should be washed clean. The engine should not be run very fast for the first few hundred miles, to give the rings plenty of time to work into a good fit and plenty of oil, in fact, more than ordinarily, should be given the engine for a time. If the engine is starved of oil when new pistons and rings have been fitted, there is danger that the cylinders might become scored or cut. So do not worry if your engine emits a cloud of smoke while running the first hundred miles.

Transforming Little Into Speedster

Q.—I have a Little roadster, 1913 model, and want to know if it would be possible to make a speedster from this model. If so, please show a plan.—E. O. Skogerson, Northfield, Minn.

An idea of how you might change this car into a speedster is shown in Fig. 4.

Underslinging a Ford

Q.—How can I undersling my Ford speedster and where can I obtain the necessary brackets?—H. C. Meng, Chicago.

A suggestion for underslinging a Ford car is shown in Fig. 6. You will probably have to have the brackets made, as there are no concerns that we know of that make a specialty of these.

This is a suggestion for lowering the frame. It consists of making three goosenecks as shown by A in the front of the car and D, the ones that carry the frame on the rear spring. The pieces A and D will have to be heated before they are bent to the shape shown. Holes are then drilled in them to accommodate the various shanks of the clips B. Piece A is provided with a hole also in the vertical part for the crank to come through. This construction places the front spring ahead of the front cross member of the frame and hence makes it necessary to use longer radius rods. At the rear, the goosenecks are placed to that the rear spring will come ahead of the rear cross member of the frame. The distance the front spring is ahead of the frame will correspond with the distance from the rear spring to rear cross member.

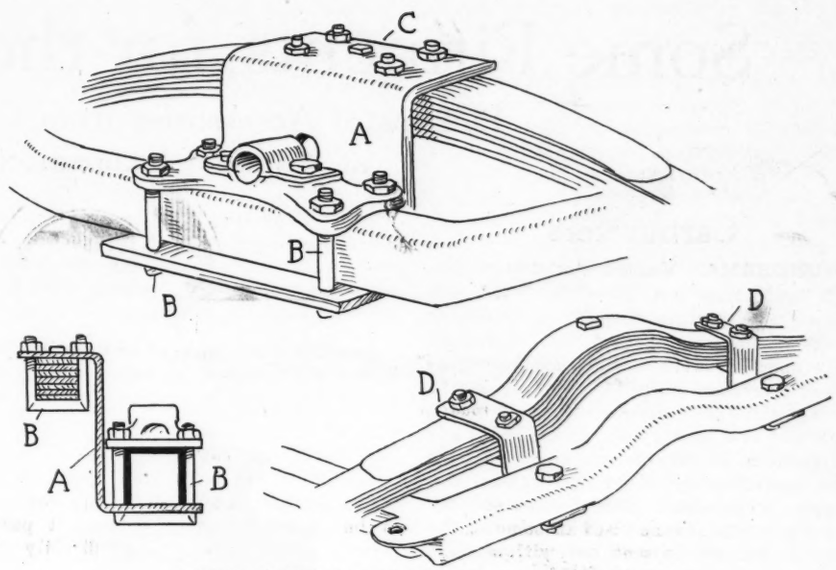


Fig. 6—Method for underslinging frame of Ford car

Transforming 1912 Overland

Q.—Publish suggestion for turning a 1912 five-passenger Overland into a racer.—Albert Oldham, Winchester, Ky.

This is shown in Fig. 5.

Engines

Engine Power on Rear Wheels

Q.—Will an engine give anywhere near the power on the rear wheels that it will on the flywheel? What percent of power is lost in the transmission of power on the rear wheels?—Walter Bromley, Spokane, Wash.

The percentage of the engine power lost in the transmission varies with the amount of power developed and the gear on which the car is driven. On high gear the loss will not be much more than 10 per cent, if everything is well adjusted and oiled. In ordinary operation the loss would seldom exceed 25 per cent.

Piston Position at Retard

Q.—In what position is the piston in a Ford motor when the explosion occurs with the spark retarded, advanced? Specify in degrees. 2—Does speed develop horsepower? If not, what does?—William B. Miller, Galena, Kan.

1—In the retarded position of spark, the piston in the Ford engine is about ¼-in. past top dead center or what amounts to about 20 deg. measured on the flywheel. When the spark is advanced the explosion takes place before the piston reaches top dead center and is about in the same position as before, only that the crank is on the other side and on its way up towards dead center. These figures vary somewhat depending on whether the Ford magneto is used or one of the several battery and distributer systems. There is a wider range of spark advance on some of these systems than others.

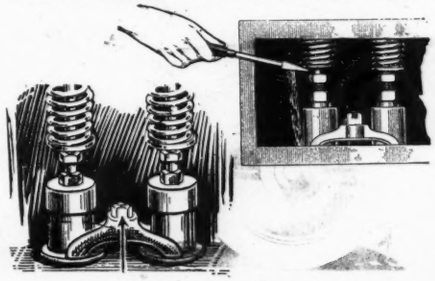


Fig. 7—To remove push rods on Overland

2—Unlike the steam engine the internal combustion engine is dependent upon speed for the production of useful work. The turning moment in a gasoline engine is not great at any time, relative to its speed, but roughly proportional to it. Hence we have to depend upon engine revolutions for power. That is why change speed gears are necessary; to keep up the engine speed when starting, or climbing hills. An engine that will develop say 15 hp. at 800 r.p.m. will produce approximately twice as much at 1600 r.p.m. if it is suitably designed.

Engine Misses at Slow Speed

Q.—When I am driving at the rate of 10 m.p.h. my car works fine, but slower than that it misses badly. I know it is due to the magneto, although the points in same are good. What is the remedy?—Clarence Mellem, Binford, N. D.

Your trouble can be caused by weak magnets, defective armature, breaker points improperly spaced, loose wiring or broken down insulation somewhere in the ignition system. If the plug points are too close, the engine will not fire well at low speeds. You do not state how old the car is; perhaps the engine has lost compression, or the timing of the valves is not correct. If the cylinders and pistons have become worn, use a heavier oil, which may help to restore compression.

We suggest that you check up on the things mentioned and assure yourself that the engine is in good order and the carburetion correct. If all the wires are in good shape and the magneto points correctly adjusted so that they open a scant $\frac{1}{32}$ in., and the missing is still in evidence, better send the magneto to the maker for repairs or inspection. There may be an internal defect in it which would be out of the question for the average owner or garageman to locate.

Some Fitments for the Ford Car

Pickups of Accessories from Collection at National Exposition

Carbureters

SUNDERMAN Vacuum Carbureter—The Sunderman carbureter for Ford cars passes the mixture through a screen to break up the gasoline particles. An air intake door is provided which as the engine speed increases opens the door against a spring and takes gasoline from both the high and low speed jets. There is no gas adjustment, as the vacuum behind the air door controlled by a spring regulates the supply of gasoline. The special size for the Ford sells for $6. With elbow, the price is $8. Sunderman Corp., Newburgh, N. Y.

U. & J. Carbureter—This carbureter has no moving parts other than the float and throttle. It has two jets, one for low and the other for high speeds. Furnished complete for Fords with a special aluminum manifold, hot air stove and adjustable dash control. It can be installed by any owner in less than an hour, it is claimed, and the only tools needed are wrench and screwdriver. Price, $22.—U. & J. Carbureter Co., Chicago.

D. & B. Carbureter—The only adjustment of the D. & B. carbureter for Fords is the gasoline needle valve in the spraying nozble. It also is provided with an auxiliary air cut-off to cut down the air supply for starting. The relative volume of air and gasoline is measured by mechanical means comprising a rotary valve which regulates the air admitted through the variable passage from intake to mixing chamber. The throttling arm of this valve is linked to the throttle arm proper in such a way that the size of the air passage is increased with the opening and decreased with the closing of the throttle. Furnished with drain cock at the bottom and removable float valve. O. C. Harrington, Chicago.

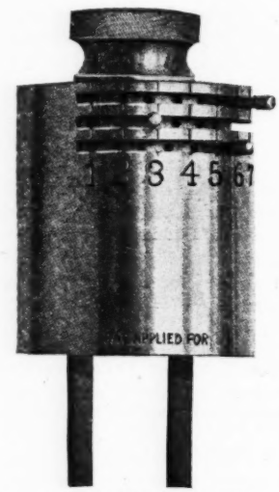
Kero-Karbureter—A kerosene carbureter equally well suited for gasoline is made by the Western Carbureter Co., Alma, Mich. It has two low-speed adjustments, one for gasoline and the other for kerosene. These are independent of each other and when once set require no further attention. When operating on kerosene the latter is drawn by engine suction from the fuel nozzle. It is surrounded by a continual stream of air which is regulated by a venturi tube. An auxiliary venturi tube is controlled from the dash. The price complete is $35.

Locks

Reliance Safeguard Lock—The housing of the Safeguard Lock is of bronze casting and the locking mechanism of finest steel to obtain sturdy construction. The steering wheel spins when locked. Price, $5—Reliance Co., Chicago.

Moss Combination Lock—Every Moss combination lock has its own combination, of which there are no duplicates. The combination takes the place of the key, and the owner can change the combination when desired. Price, $5—Moss Auto Combination Lock Co., Chicago.

Security Auto Lock—The Security Lock is made of highly nickeled, strong and heavy brass and is equipped with a non-pickable lock with two keys. It is attached under the steering wheel and can be installed in 10 min., it is said. No filing or drilling is necessary, as the lock screws on. When locked the steering wheels spins, that is, is out of play. Price, $5—Security Auto Lock Co., Chicago.



Moss combination lock

Elka Switch Lock—The Elka switch is a self-locking device which locks without the key by turning the lever to neutral. To unlock, the key is inserted and the lever moved to magneto. The device is fitted with Yale pattern, four-pin tumbler lock, face plate black enameled, lock and lever nickel plated. Price, $3—Elka Mfg. Co., San Francisco, Cal.

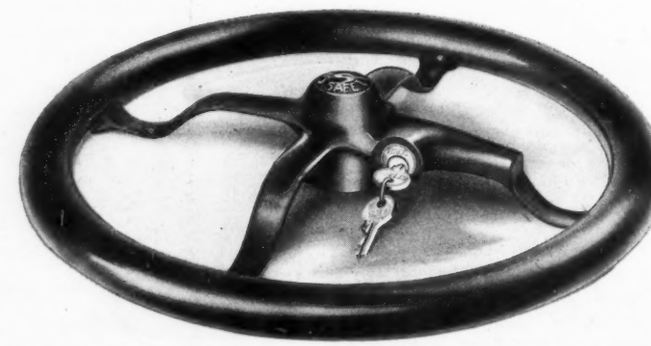
Perry Auto Locks—Besides the Perry lock, which temporarily disconnects the steering wheel from the steering column when the car is idle, of which there is a new model, the Perry lock tire carrier is offered. This device is built into the tire carrier and may be purchased with a key that fits both the lock on the tire carrier and the lock steering wheel.—Perry Auto Lock Co., Chicago.

U. S. Safety Lock—The U. S. Safety Lock fits into one of the rods of a steering wheel and presents a very slight change in the appearance of the complete steering wheel. To lock, the Yale key is removed and the steering wheel spins. To unlock, the key is inserted. Price, $7.50—U. S. Auto Lock Co.

Defender Lock—The Defender lock is made of cast aluminum. Two cylinders are used, one for locking the casing to the Ford switch block, the other for operating the

Eika switch self-locking device

Security lock



U. S. safety lock which fits into steering wheel rod

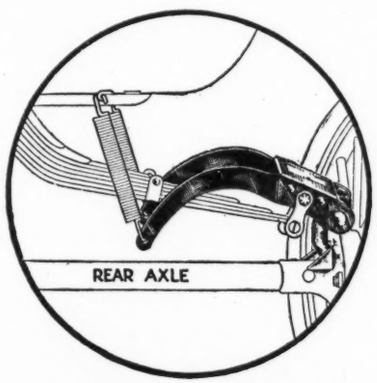
switch. The locking band locks the lid of the coil box, preventing removal of the coil units. To install, the Ford face plate is removed from the switch block and the intercepting switch blade is inserted into the slots of the Ford keyway. The Defender face plate is screwed on with the same three screws that were taken out, and the grounding plate is taken over the radiator stay rod to make good connection with the locking band, which slips over the coil box, with the casing over the switch block. Defender Auto Lock Co., Detroit.

Wheels

Houk Wire Wheel—The Houk wire wheels, which are made in various sizes and with plain clincher and quick-detachable rims, include a special set for Ford cars. The wheels are held in place by a hub cap that turns tighter as the car advances and this cap is threaded internally with the outside conical or tapering. Wire Wheel Corp. of America, Buffalo, N. Y.

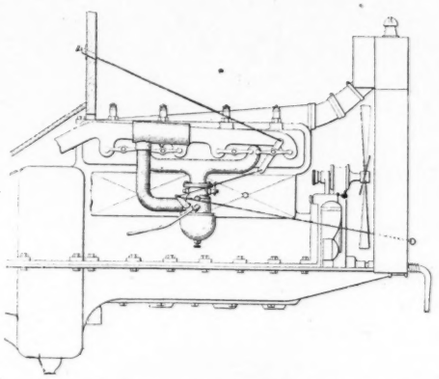
Hub Cap Demountable Wheels—The Hub Cap demountable wheels work universally both front and rear and carry 30 by 3 or 30 by 3½ tires. Tire and wheel are changed by removing the hub cap, one operation. None of the Ford parts is destroyed, and the original Ford wheels and hubs are used. Price, $15. Auto Accessory Mfg. & Sales Co.

Dayton Wire Wheels—Five wheels and four inner hubs constitute a set of Dayton quick-detachable wire wheels. The wheels are interchangeable, and the inner hub mountings for the axle spindles are so arranged that any wheel may be changed from one position to another with no operation other than the unscrewing and replacing of the hub cap. Price per set of five with plain clincher rims, four inner hubs, four hub caps, hub cap wrench, spoke-nipple wrench and outer hub dust cover for spare wheel, black enamel, $60: other colors, enamel finish, $65; boxing for export, $5 extra. Dayton Wire Wheel Co., Dayton, Ohio.

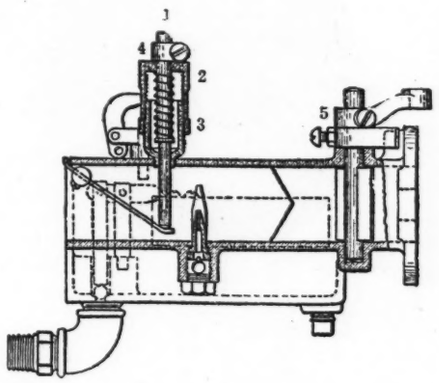


R. & R. shock absorber

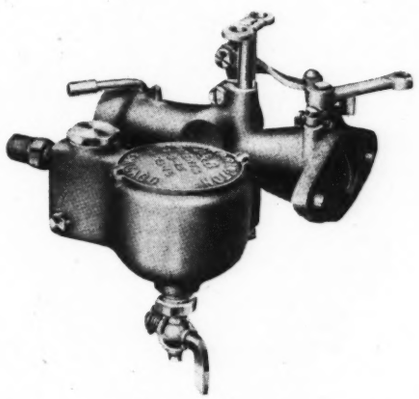
Hassler shock absorber



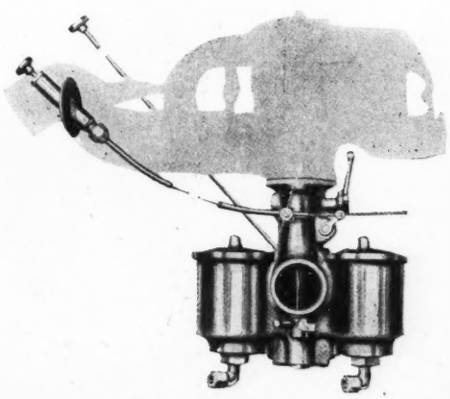
U. & J. carbureter, installed on Ford car



Sunderman carbureter



D. & B. carbureter



Kero kerosene-gasoline carbureter

Pasco Wire Wheels—The Pasco wire wheel has a patented series of rim punching and spoke lacing methods of construction in which all spokes cross four others in both front and rear rows. The Pasco hub cap locks itself and wheel on the threads of the inner fixed hub and axle and, it is claimed, will not work loose or allow wheel to come off moving car under any circumstances. To remove the cap a safety lock must be released first and then a wrench used. A complete set of inner hubs are included to take the place of those on the Ford originally. Price per complete set of five 30 by 3½ with plain clincher rims in standard black enamel, $75, with an additional charge of $5 a set for any color. National Wire Wheel Works, Inc., Geneva, N. Y.

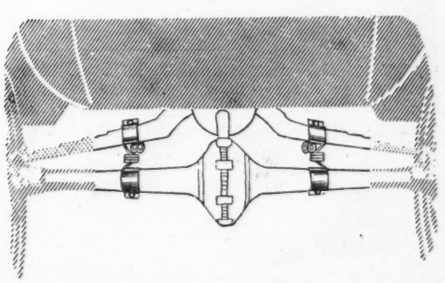
Grant Wire Wheel—The Grant wire wheel is designed to replace the stock wood wheel without a special hub or bushing. It is not demountable, but a demountable rim is used for tire changes, so only four wheels need be purchased, the spare parts being carried on a demountable rim as with stock wood wheels. The spokes are laced for equal tension at all times and side thrusts will not disable them, it is said. Price for set of four for Ford, $30. Grant Wire Wheel Mfg. Co., Chicago.

Simplicity Wheel—The Simplicity demountable wheel outfit consists of four steel ring retainers, twenty-four high test steel bolts with hand-turned threads, twenty-four dome nuts Parkerized, a socket wrench, spare wheel and special patented wheel carrier. By removing six dome nuts on the outside flange of the wheel and pulling the wheel off the hub, the entire operation of changing can be done in 4 min. or less, it is claimed, by the ordinary driver. Simplicity Wheel Co., Grand Rapids, Mich.

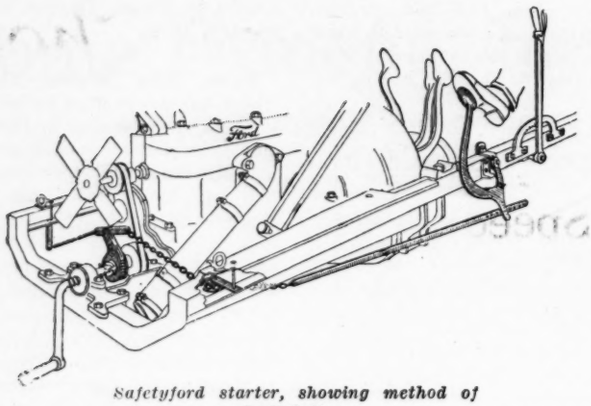
Shock Absorbers

Hassler Shock Absorber—The Hassler shock absorber is a spiral, conical spring of chrome vanadium steel. It is attached to the leaf spring and the axle. To attach, the only tool necessary is a Ford rear wheel puller. There is no cutting or drilling. Shipping weight is 40 lb. a set of four. Robert H. Hassler, Inc., Indianapolis, Ind.

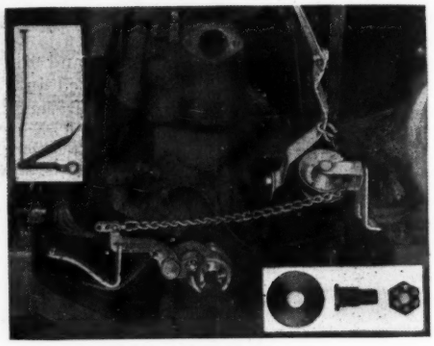
R. & R. Shock Absorber—The R. & R. double arm flexible ride steel cantilever shock absorbers can be attached in about



Naber Stopshock springs



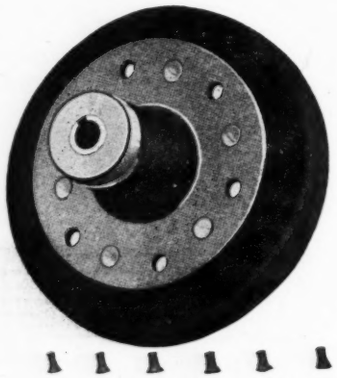
Safetyford starter, showing method of installation



Woods pinch clutch starter

15 min., it is claimed. To connect the rear arms a one-piece drop-forged steel perch is used. A set of four sells for $12, though a single-arm type of high-grade malleable iron with drop-forged steel perches sells at $10 a set of four. R. & R. Mfg. Co., Elgin, Ill.

Naber Stopshock Springs—The Naber Stopshock springs are located between the spring and axle to prevent violent throws upward and drops due to speed or rough roads. To attach, the springs are pointed under the car in a natural position, with bolt head out, and nuts fastened with nut lock. Price, $8 for set of four.—Naber Stopshock Co., Chicago.



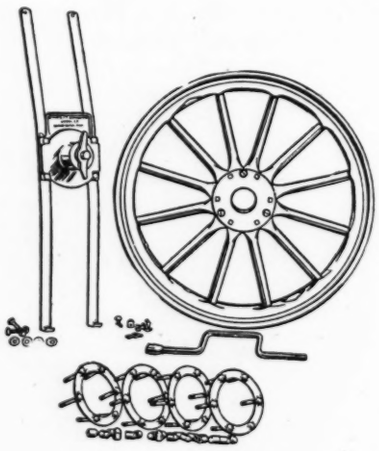
Hub of Hub Cap wheel

Reflex spark plug

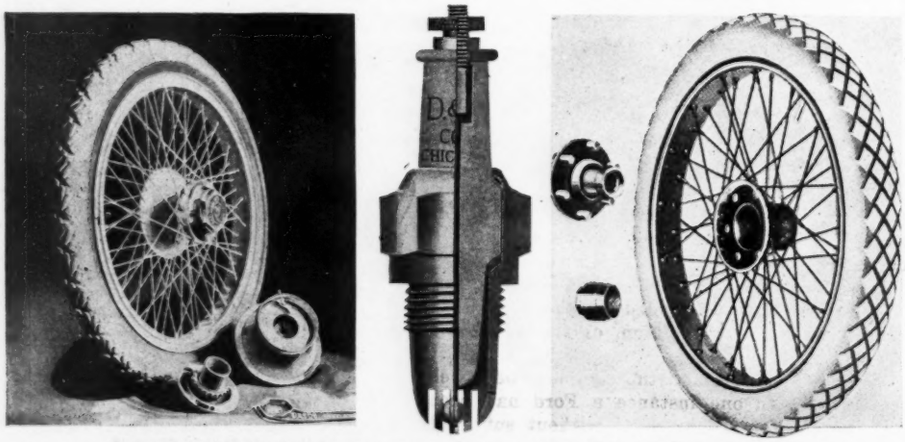
Spark Plugs

Reflex Plug for Fords—The Reflex Ignition Co., Cleveland, Ohio, along with its other plugs, makes a long-barreled plug for Fords. It has a long steel body with threads at the base, raising the plug center up from the oil and the dirt of the cylinder. Nickel electrodes are fitted. The bushing is heavy and a heatproof porcelain core of the petticoat type furnished. Finished in gun metal, it sells for 75 cents. Extra cores, 35 cents.

Fouless Spark Plug—The outstanding feature of the Fouless self-cleaning spark plug is the construction of the firing end. This is simply a continuation of the shell or body and is semi-spherical and provided with four splits. In the interior of this firing cage is a steel ball which keeps the parts bright under all conditions, it is claimed. The plug has a long body and the porcelain is non-removable. Added power and increased flexibility and freedom from fouling are the merits claimed for it. Price, $2. D. & D. Co., Chicago.



Simplicity wheel outfit



Left to right—Pasco wire wheel, Fouless spark plug and Dayton wheel

Starters

Safetyford Starter — The Safetyford starter is attached without drilling, as the holes used are those already on the Ford car. The crank is not touched and remains in position. To operate step on the starting pedal as you would on the clutch. The device automatically disengages itself when the engine is running or when it backfires. Price, $11. Safetyford Starter Co., Los Angeles, Cal.

Woods Pinch Clutch Starter — The Woods starter operates from the seat with a lever. A disk cam forms a pinch clutch, and all parts are made of steel. A long stroke throws the shaft over the first compression on to the second. Installation requires about 2 hr. The starter is free when the car is running, and as there are no springs, rivets or screws to come loose, there is nothing to rattle or get out of order, it is claimed. A primer is included in the equipment. Price, $15. American Steel Supply Syndicate, Detroit.

(Continued next week)

The Motor Car Repair Shop

One Way to Install Speedometer Drive Sprocket

OCCASIONALLY repairmen or owners are confronted with special installations of standard equipment or accessories which require making new parts and a general rearrangement of the various units. Take for example the road wheel gear that drives the small fiber pinion of the speedometer drive. There are on the market several different types of wire wheels designed to fit the present hubs on the Ford car, and some of these do not provide for a suitable speedometer installation and either the owner goes without or rigs up suitable means for attaching the road wheel gear.

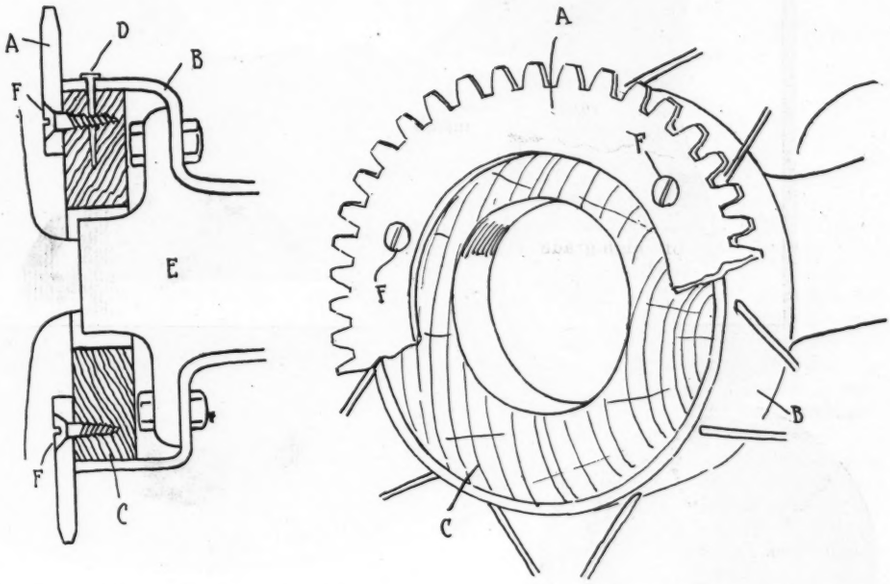
Shell for Hub

One make of wire wheel for Fords has merely a shell for the hub which is intended to slip over the standard Ford hubs and bolts in place, utilizing the same holes as before. The flange of the wire wheel hub in this case extends close to the spindle body, as shown in the illustration, and makes no provision for installing a sprocket with 60 teeth. The diameter of the wire wheel hub at this point, with this make of wheel, is 6¾ in. and no sprocket wheel, with 60 teeth—assuming that the car has 30 in. wheels—is obtainable that will slip over the hub and fasten to the spokes by clips like those used in motorcycle practice. The largest sprocket of the right number of teeth that could be procured for these wheels, fitted the hub about as shown at A. The hub or shell of the wheel is shown by B. The gear was finally put on in this manner:

A block of hard wood C was turned in a lathe so that it fitted snugly into the recess of the hub. It was bored out in the center to allow the spindle to pass through. At diametrically opposite points on the hub two small holes were drilled and lath nails driven in them into the wood disk C. These are shown by D. The nails prevent the wood from loosening. The regular Ford hub is shown at E, together with the bolts that fasten the latter to the wire wheel shell B.

Holding the Gear

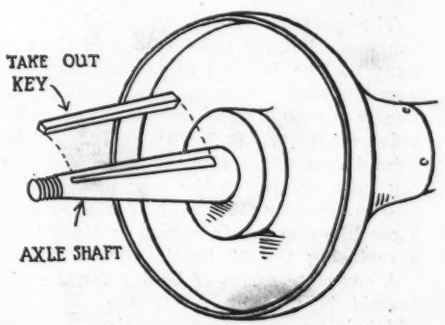
In the sprocket were four holes which were countersunk for flat-head screws F used to attach the gear to the wheel. The four screws, being driven in to hard wood hold the gear firmly in place and as there is little or no strain on the speedometer gears there is no danger of the installation becoming changed. Before attaching A to C the gear should be centered in order that the gear might not run eccentric and cause excessive wear of the fiber pinion. To center it, scribe a circle on block C, before the center is bored out, of a diameter equal to the inside diameter of the gear. To make sure of this tack the gear in place temporarily and place the wheel in position on the spindle. Bring the speedometer gears into mesh and rotate the front wheel, at the same time watching the action of the gears. When the proper center has been found, spot the holes for the screws and with a drill somewhat smaller than the screws bore the holes in the wood.



Illustrating a way for repairman or owner to install speedometer drive sprocket on a wire wheel which slips over standard hub

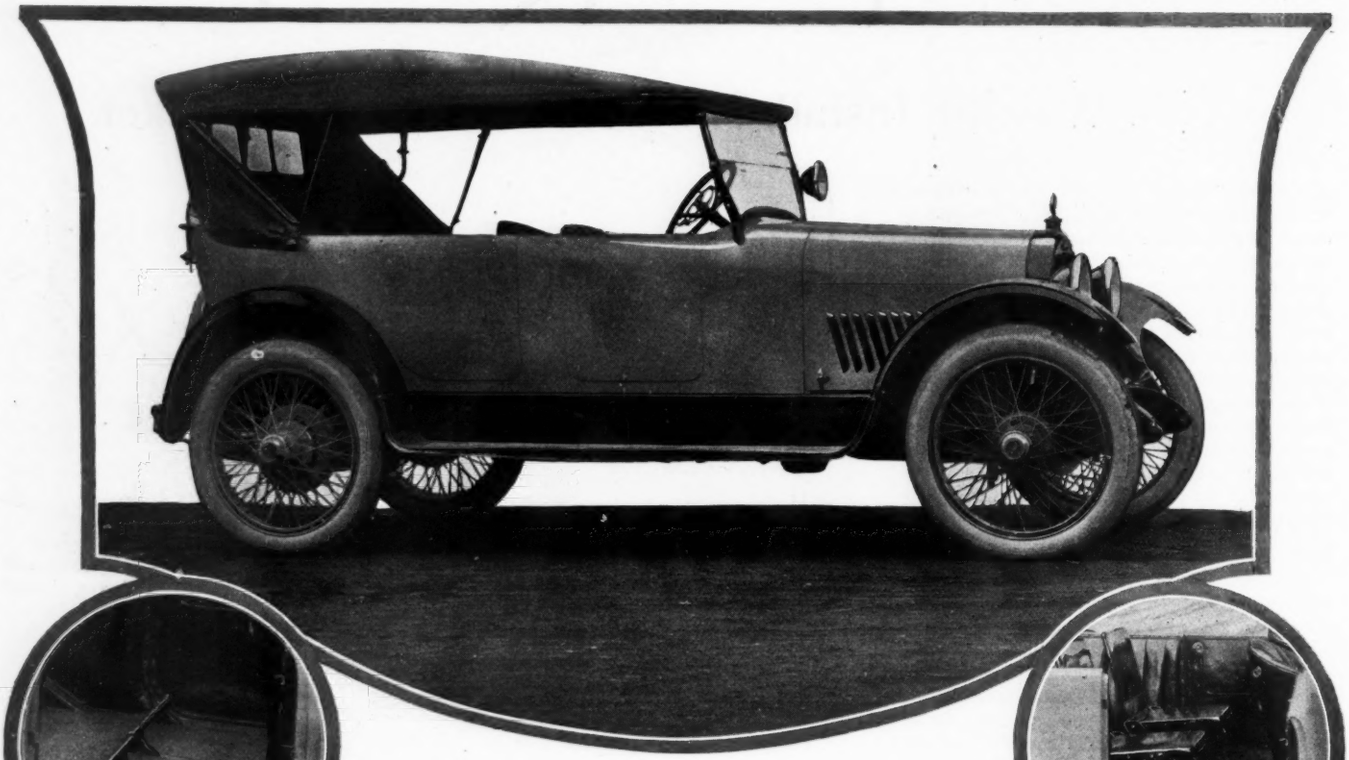
Roadside Repairs

Serious mechanical breakdowns are not common with a Ford car, but occasionally one is found stranded on the road with a sheared drive pinion, or the like. Obviously in such a case roadside repairs are impossible and the car must be towed home. In one instance a Ford had been driven for a long time without sufficient lubricant in the differential housing with the result that several teeth on one of the differential gears fastened to the ends of the axles sheared and became wedged in the mechanism so that the differential was locked and the rear wheels could not be revolved. Needless to say, the repair could not be made on the spot, but what was worse, the car could apparently not be towed. One of the persons in the party conceived this idea as a solution: Each rear wheel was jacked up, separately, and the castellated nut that holds the wheel to the axle shaft unscrewed so the wheel could be taken ff. Then the key on the tapered portion of the axle was taken out and the wheel replaced. Grease was applied profusely inside the hub and the nuts put back. After the jack was lowered, the car could be moved easily, as the removal of the keys allowed the wheels to spin on the ends of the axle shafts. Help was obtained and the car towed home.



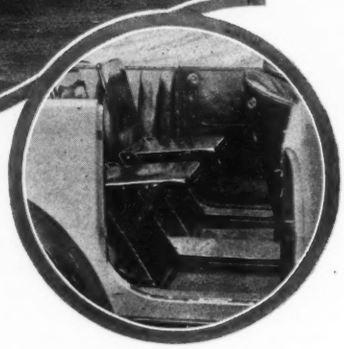
To tow car with sheared drive pinion

New Design in 1918 Lexington



How the spare seats "submerge" in the floor

Latest Minute-Man Six Is Larger



The spare seats adjusted, showing space in floor

THE Brush type of frame design, in which the running boards are incorporated as a part of the frame member, is to be one of the features of the new series of Minute-Man Sixes for 1918 of the Lexington Motor Co., Connersville, Ind. This concern, formerly the Lexington Howard Co., recently re-incorporated under the new name. The new chassis model which embodies this feature is known as the model R, and comprises a number of other departures from previous Lexington practice, as well as at least the one combination of design which heretofore had not appeared. This latter is the use of a semi-elliptic rear spring with the Brush frame.

The present Lexington model will be continued but the chief efforts of the company will be devoted to production of the newer model. This is a six, using practically the same Continental engine as the older model 0, 3¼ by 4½. The car has been increased in size, the wheelbase being now 122 in. in the new model which is 6 in. greater than that of the model 0. Tires likewise are increased in size, 34 by 4 replacing the 32 by 4.

A complete series of bodies for the new chassis is projected, but the only one which is announced at this time is called by the Lexington company, "a five passenger with submerged seats," by which it is meant to convey the fact that it is an exceptionally roomy five-passenger body with two additional spare seats which disappear completely within the tonneau floor boards. This sells at $1,585.

Little Change in Engine

In the engine, there is little change except in the crankshaft and flywheel, the crankshaft now having inherent balance. This is the Continental 7-W. Engine equipment remains the same as in the model 0, this being Connecticut ignition, Rayfield carbureter, with Westinghouse starting and lighting.

The Moore multiple exhaust, which was designed by the chief engineer of the Lexington company, and has been a feature of Lexington construction for years, is continued in the new model, but is changed slightly so that the exhaust pipe is brought down under the rear motor arm, thus putting greater distance between the exhaust manifold and the toeboards—this for the sake of comfort in warm weather. The Moore multiple exhaust, it will be remembered, is based on the principle of reducing the back pressure in the exhaust line, by having two separate passages in each of which alternate cylinders exhaust, instead of having them all exhaust into the same header as in the conventional type. The latest tests of the efficiency of this design of exhaust in the exceptionally well-equipped new test laboratory at the Lexington plant, it is stated show an increase in power of 22.8 per cent for the Moore manifold as compared with the conventional design.

Details of the Continental engine can be summed up as follows: The crankcase is divided horizontally, the lower half being of pressed steel; the crankshaft is supported on three large bearings of the Phoenix babbitt, backed with bronze; lubrication is by combination of force feed to main bearings and splash to connecting rods and pistons, the pressure being maintained by a plunger pump operated from the camshaft. The carbureter is bolted directly to the engine block and takes hot air direct from the exhaust manifold, both of which features assist in handling the present-day fuels.

The three-speed gearset carries gears of 3½ per cent nickel steel, of 6-8 pitch and ¾-in. thickness, mounted on double row annular bearings. It is the product of the Warner Gear Co., and upon it is mounted the tire pump. Also the speedometer is driven by a worm gear from the gearset. Both speedometer and pump gears run in oil from the gearset. Power is trans-

mitted from the gearset to the Hess floating axle to a seamless steel tubing propeller shaft fitted at either end with Thermoid-Hardy disk universal. The advantages claimed for this universal have been dwelt on before, and they can be summed up in the statement that they are noiseless, both as to their own action and in that they prevent the transmission of noises along the shaft and also that they require no lubrication. The reduction at the rear axle is through a spiral bevel gearing.

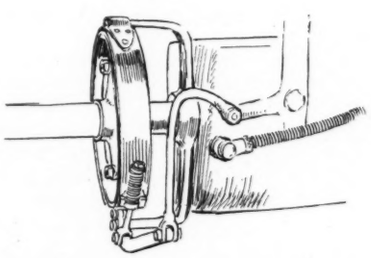
Braking System

In the braking system, Lexington uses a propeller shaft brake for the emergency. It is an external contracting band, mounted on the rear of the gearset housing and acting on an eight-inch drum attached to propeller shaft and surrounding the forward universal. The service brake is an internal brake, acting on 14-inch drums, mounted on the rear wheel.

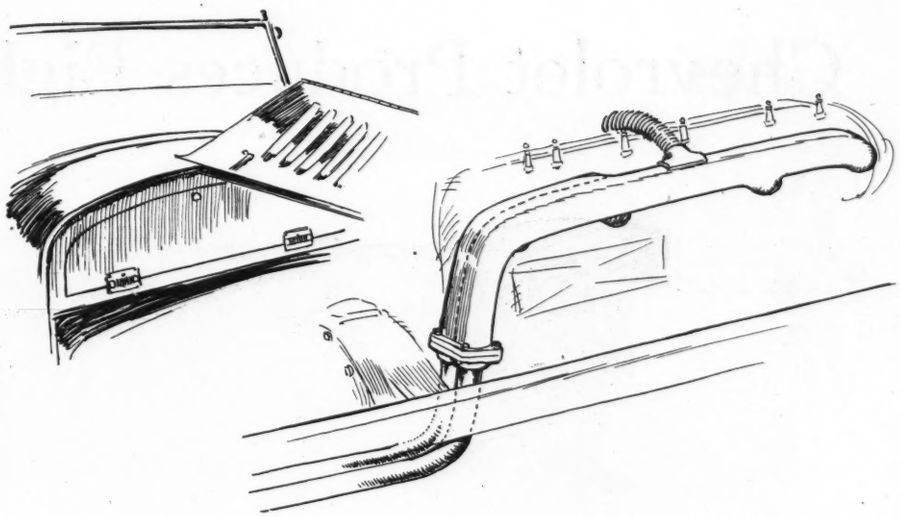
The Brush type of frame has been described in detail before. Suffice it to say that in this instance it comprises a Z-shape of 22 point carbon steel, the side rails being 2½ in. wide on top and 7¾ in. deep, combining the wide running boards as a part of it. These are hot-riveted to the bottom flange of the side rail and across the vertical section at the front and rear, where the running boards curve up to meet the fender at the top of the frame. The frame is designed so that the deep vertical web is directly underneath the outer edge of the body. This gives increased rigidity to the finished car and permits very light sills to be used in body construction.

A new radiator design is incorporated in the new car. It is higher and narrower and the front end of the car is housed in with a new splash plate. The hood is of heavier gage steel than ordinary and tapers from the radiator directly into the body line without breaks. It is equipped with double concealed center hinges, so designed that both sides of the hood can be raised at the same time. The running boards are formed as a part of the frame, so that stephangers are done away with. They are turned up at both front and rear to meet and bolt to the fenders, at the top of the frame. Safety steps are provided at the front of each door in addition to the rubber mat which covers the running board.

The Westinghouse electric system comprises a 6-volt generator and a motor engaging with the gear on the flywheel through a Bendix drive. The 100 amp-hr. Willard storage battery is carried beneath the floorboard on the driver's side and supported from the side rail of the frame. An ammeter and lighting switches are mounted in a cluster on the instrument board, with a key for locking ignition and lights.



Structure of propeller shaft brake on Lexington



Left—Cupboard under the hood of the new Minute-Man Six. Right—Divided exhaust manifold, which is changed slightly

An unusual feature of equipment is a spotlight which is permanently mounted on the windshield bracket. Lighting, starting and ignition circuits are independent, the lighting being single wire.

One of the features of the car, particularly in its appearance from the rear, is a distinctive design of tire rack. This comprises a dummy hub carrying three wood spokes and the regular Goodrich felloe. Across the hub is carried the Lexington nameplate.

Underneath the cowl is a large locker for overalls, gloves or other impedimenta, and this opens from underneath the hood, and takes up the space that would be occupied by the cowl gasoline tank. The fuel tank is at the rear and fuel is sent to the engine through a Stewart vacuum feed.

Ease of maintenance has been studied as evidenced by the fact that there are only four oil cups on the car, and only two grease cups. Everything else being taken care of by oilless bushings.

TRUCKS RELIEVE LONDON TRAFFIC

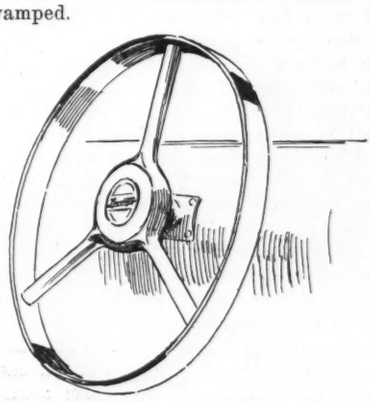
London, England, Sept. 1—This city, not having the large terminal facilities for handling railroad freight which are found in major American cities, is experiencing traffic congestion which would not be experienced in other but war times. Other cities, notably Liverpool, are in a similar condition. To lessen this congestion in the London district the commandeering of all steam motor trucks except those engaged specifically in government work, is being considered. Trucks of this nature are unknown in America, but they are generally of 3- and 5-ton load capacity, burn coke and their fuel and maintenance cost are considerably less per ton-mile than gasoline trucks.

Estimates suggest that 2000 or 3000 of these trucks can be obtained for the handling of freight over short distances in the London zone, thereby freeing railroads from the necessity of using their cars for hauls of 20 or 30 miles from the city. In addition to freeing railroad cars it also would reduce the congestion on tracks and side tracks in the city zone.

So far as England is concerned this suggested plan is the first concerted example of many motor trucks being used to relieve railroads. Throughout the country are scores of firms who use motor trucks for hauls of 100 to 120 miles, such being in direct competition with the railroads, but the new plan is one in which the trucks are intended to relieve railroad congestion.

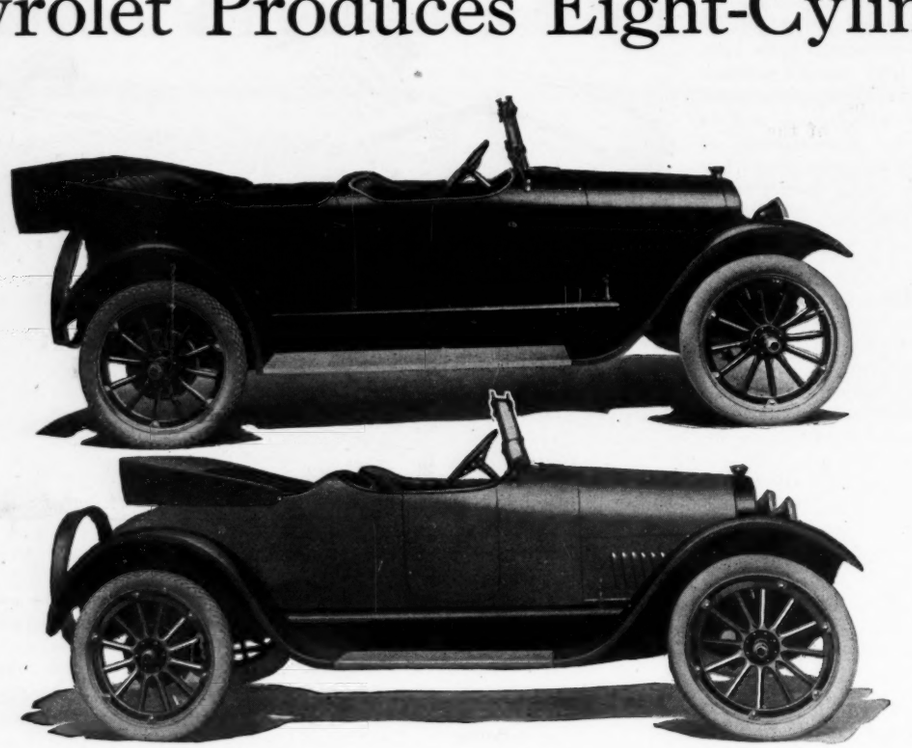
BAY STATE DOWNS BUGBEAR

Boston, Mass., Sept. 21—Figures of the Massachusetts Highway Commission show the Bay State torpedoed the bugbear of war retrenchment as far as the buying of motor cars here is concerned by registering in July and August about seven times as many cars, a period of just two months, as the increase for the first half of 1917 showed over all of 1916, listing 3262 more cars than in 1916, when there were 117,615. In July and August 15,451 were added. During the first six months the trucks led the cars in the increase, but in the last two months the commercial vehicles were swamped.



Distinctive design of tire rack on rear of Lexington

Chevrolet Produces Eight-Cylinder

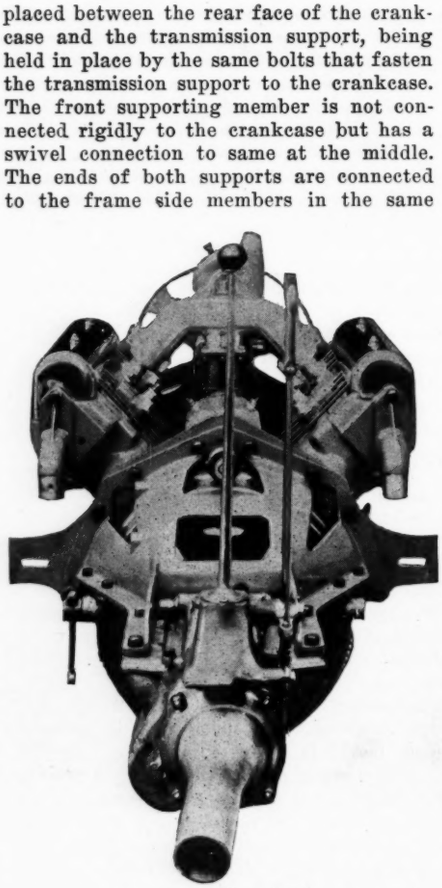


Five-passenger and four-passenger models of Chevrolet eight, which will sell at $1,385

THE new Chevrolet eight-cylinder car is much larger and more powerful than any Chevrolet of recent years. It has a wheelbase of 120 in. and is equipped with an engine 3⅜ by 4 in., which gives a piston displacement of 286.3 cu. in. With either a four- or five-passenger body the car sells for $1,385.

In many respects the engine design follows previous Chevrolet practice. Overhead valves are used, being operated by tappet rods and rock levers, and lubrication is by splash. The engine is a three-point suspension high-speed type, running up to 2400 r.p.m. Each set of four cylinders, with half the upper part of the crankcase, is cast on a single block, though the cylinder heads of each set are a separate casting fastened to the blocks by bolts. Half the crankcase being cast integral with the cylinders, the crankcase is divided into a vertical plane. The valves have a diameter of 1½ in. and a lift of only ¼ in. The pistons are of conventional design, of gray iron castings with compression rings at the upper end. The connecting rods are drop-forge of carbon steel and heat treated, with bronze bushings at the small end and bronze-backed babbitt bushings at the large end. Connecting rods of oppositely-located cylinders are mounted on the crankpins side by side, the two cylinder blocks being staggered.

The supporting means of the engine are a development of the design used on the four-cylinder Chevrolet. Two steel pressings are used, which extend all the way across the frame and are fastened to the side members. The one at the rear is placed between the rear face of the crankcase and the transmission support, being held in place by the same bolts that fasten the transmission support to the crankcase. The front supporting member is not connected rigidly to the crankcase but has a swivel connection to same at the middle. The ends of both supports are connected to the frame side members in the same way. A casting is let into the channel of the frame member and secured to it by rivets. The inner phase of this casting is machined off, and the ledge is formed at the lower end, on which the engine support rests. It is held against endwise motion by dowel pins in the casting and is secured to the frame by U bolts passing through slots punched in the support and through holes in the casting and the frame, and nuts are screwed over the ends of the U bolt outside the frame and locked by spring washers.



Rear view of powerplant, showing form of transmission support

The crankshaft has three main bearings, the front bearing being 1¾ by $3\frac{5}{16}$ in. long, the center bearing $1\frac{31}{32}$ by 2 in. and the rear bearing 2 by $3\frac{7}{16}$ in. The connecting rod bearings are $1\frac{7}{16}$ by 1½ in. The main bearings are of the same type as the connecting-rod large-end bearings. A single camshaft operates all the valves. This is located directly above the crankshaft and is supported in three bearings.

Lubrication is by splash, in which the oil is circulated by a plunger pump on the right-hand side of the engine. The plunger of the pump extends through the crankcase and is operated on by an eccentric on the camshaft. The pump forces the oil through a distributor pipe inside the crankcase with outlets to individual trough. To lubricate the valve mechanism on top of the cylinders an oil pad soaked with oil is placed over the rock levers and held in place by the valve cover.

Gasoline is supplied from a rear tank through the Stewart vacuum system. The carbureter is a double Zenith. Both the inlet manifold and the exhaust manifold are cast in the cylinder heads, so there

is only one inlet connection and one exhaust connection to each cylinder set. Battery ignition is used. A Remy combined timer and distributor is mounted on the rear end of the generator and driven by a vertical shaft. Starting and light is by Auto-Lite two-unit type, with both generator and starter in the V of the engine. The generator is driven off the camshaft gear. The radiator fan is mounted on an extension of the armature shaft and is driven through positive gearing but held on the shaft by a friction clutch which allows it to slip slightly in sudden changes of engine speed. The starter drives to the flywheel through a Bendix drive.

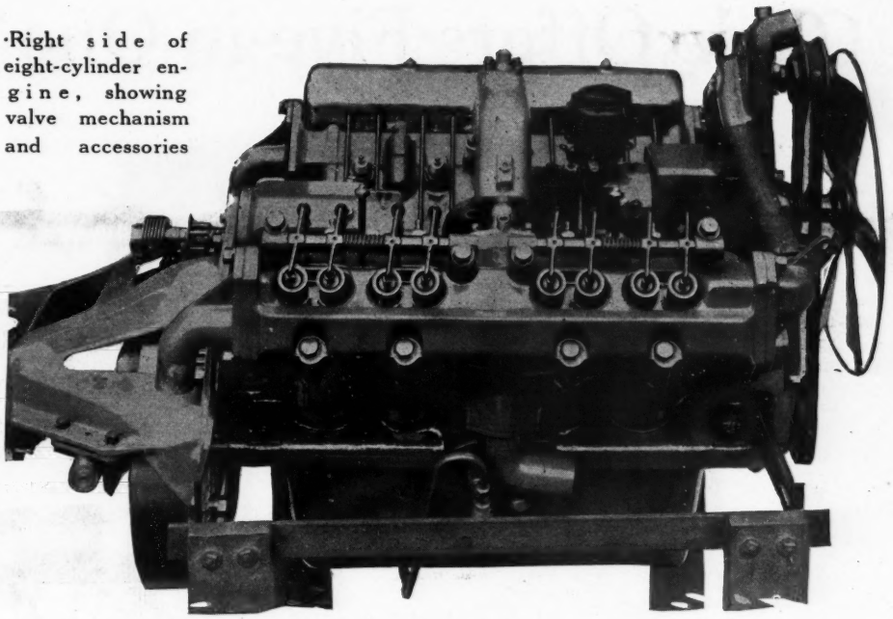
A 6-volt, 120-amp.hr. Willard storage battery is carried. Light equipment includes two 16-cp. headlights with 4-cp. dimmer bulbs, a 2-cp. tail light and an instrument-board light.

Cooling is by a centrifugal pump located in the line between the jacket outlet and the radiator, which makes the pump accessible and facilitates the drive. The pump is driven from the crankshaft by a trapezoidal belt. The radiator is of the hexagonal cellular type and has a separate drawn-steel housing.

Cone-type Clutch

The clutch is a leather-faced cone type with ten auxiliary springs under the leather to insure smooth engagement. Transmission is of the three-speed selective type operated by a central control lever of the ball-mounted, ball-ended type. The transmission casing of cast iron is supported from the engine crankcase through the intermediary of the so-called transmission support, which extends about halfway around the flywheel but has openings in it to permit access to the clutch and for lightness. All bearings in the gearcase are New Departure.

Transmission to the rear axle is by an enclosed shaft with two universal joints, whereas in ordinary practice where two universals are used the propeller shaft is exposed. To make it possible to inclose the shaft, each of the two universal units is surrounded by a spherical joint filled with grease for the lubrication of the universal. The final drive is through helical bevel gears, the reduction ratio being 4¼ to 1. The rear axle is of the built-up type, comprising a malleable central housing and steel tubes, together with malleable break supports at the ends. All the bearings in the rear axle assembly are the Hyatt flexible roller type, except for the thrust bearings, which are ball-bearing. The rear axle is of the semi-floating type, the driving wheels being keyed to the ends of the Vanadium steel axle shafts. Since there are two universal joints in the propeller shaft, neither the driving thrust nor the torque reaction can be taken on the propeller shaft housing. Torque reaction is taken up on tubular triangular torque member and the driving thrust is taken on the rear springs.

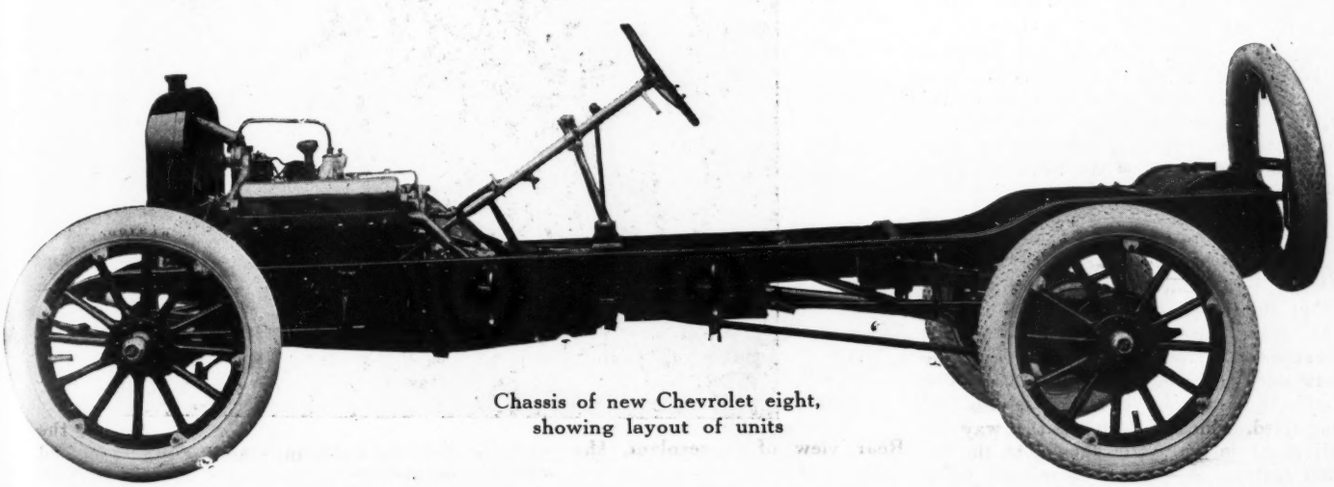


Right side of eight-cylinder engine, showing valve mechanism and accessories

Both sets of brakes act directly on the rear wheels. The brake drums are 12 in. in diameter and have a working face of 1¾ in. The internal brakes, which are cam operated, are the service brakes and the external brakes, which are operated by the usual floating lever mechanism, are the emergency brakes. The brake-operating shafts extend forward of the rear axle about half-way to the propeller shaft, where they are supported in brackets on the axle housing. There is an intermediate brake shaft about midway between the brake pedal and the rear axle.

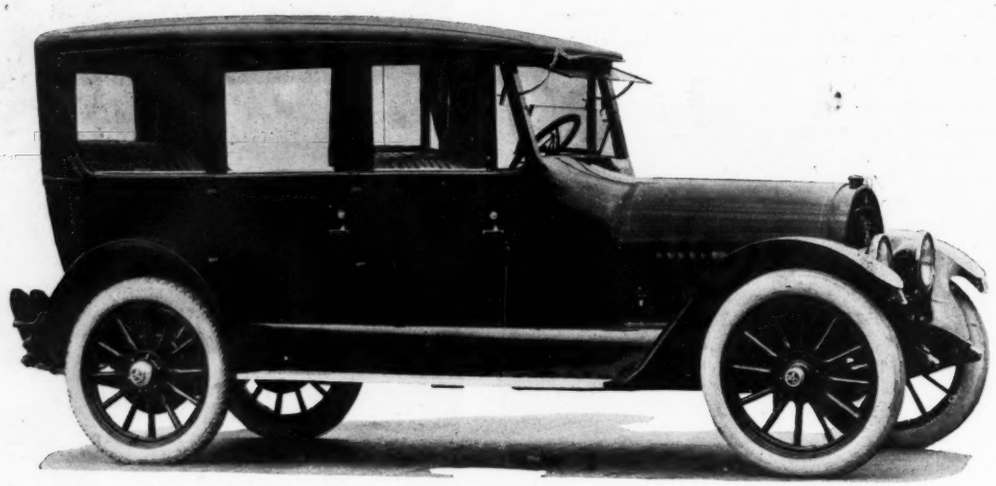
The pressed steel frame channels are straight except for a kick-up over the rear axle. They have a section of 4½ by 1¾ by $\frac{5}{32}$ in. At the forward end the frame is supported by the usual half-elliptic springs, but at the rear end quarter elliptic cantilever springs are used, being secured by clips and bolts to pads on the axle housing and brackets on the frame respectively. These springs take the driving thrust. Where the rear springs fasten to the frame, the latter is provided with a cross member which is secured to the side members by very large gusset plates. The wheels are of the standard wood artillery type, fitted with 34 by 4 Goodyear tires on demountable rims, the rear tires being non-skid.

Equipment includes a one-man weatherproof top with side curtains, a speedometer, complete lighting and starting system wired on the ground-return principle, tire carrier, license holder, tool kit, tire pump, tire repair kit, spark plug wrench, hub cap wrench, jack and inspection lamp, etc. The cowl is equipped with a vent which assists in cooling the motor compartment, and the windshield is of special design with nickel and mahogany finish. The touring car with all supplies, ready for the road, weighs about 3200 lb.



Chassis of new Chevrolet eight, showing layout of units

Cole Offers Five-in-One Toursedan



Cole toursedan designed to give five types in one car

THE Cole eight, four-door toursedan is designed to include all five- or seven-passenger types of car that may be desired in one. Through an individual arrangement of glass panels at the sides and a dividing glass partition quick-change operations transform this new product of the Cole Motor Car Co. into berline, town car, limousine, sedan or, in fact, practically any style of open or closed body.

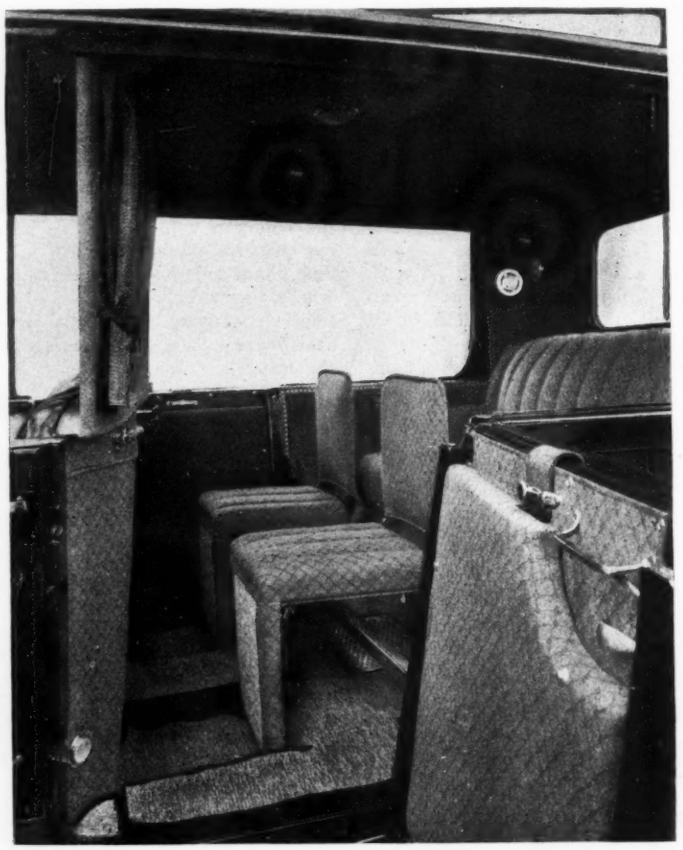
All the windows can be lowered or removed entirely. The driver's compartment also is equipped with windows that can be raised or lowered at will. By lowering the glass panels in the front doors into the bottom door panels and leaving the glass partition and the windows surrounding the tonneau in place—presto, a town car. By removing the partition and raising all windows, the toursedan becomes a sedan. By lowering the windows while the partition is removed—the car becomes a permanently roofed open touring car.

Three auxiliary seats are designed to fold completely out of sight in the back of the front seats when not in use, giving the car the usual five-passenger capacity. The four-door feature gives the independent entrances to both front and rear compartments. Ample leg room and seating capacity are provided for in the dimensions. Silk roller curtains are provided at all windows in the rear compartment, as well as at the glass partition between the driver's compartment and the tonneau. An electric telephone is provided for communication with the driver when the glass partition is closed.

Automatic door lights switch on and off as the doors are opened or closed or can be kept lighted permanently if desired. Interior lights include a dome light and corner lights, all of which are controlled both from the driver's seat and from the rear compartment. A special Waltham clock over the windshield is in full view of all the passengers, and an in-a-door tool compartment in the left front door, with individual holsters for each tool, is another feature. A ready-attached tire pump with hose and gage fits under the driver's seat.

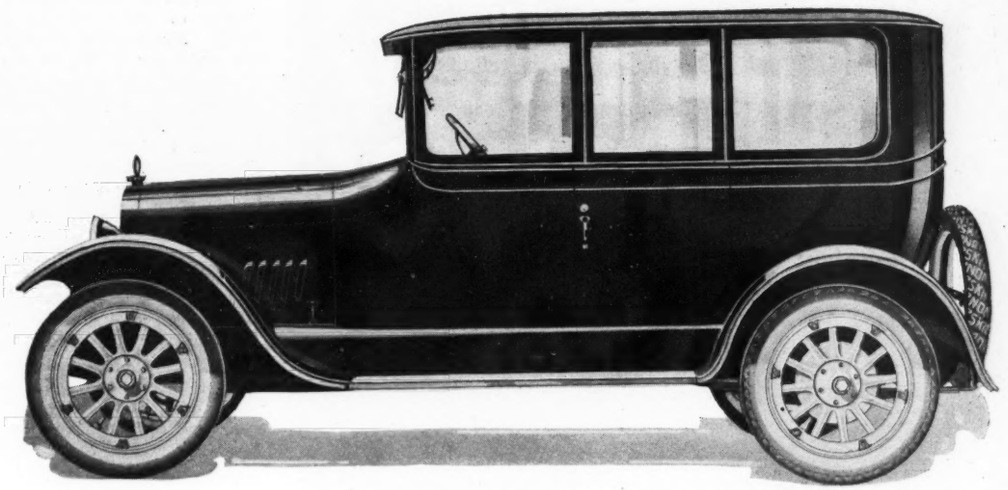
The tilted windshield is of the full ventilating, rain-vision, double-visor type with removable side panels that can be stored, one at each side of the front compartment under the dash, when not in use. Padded shelves for the storage of the rear quarter glasses are built into the back of the rear seat, while all upper glass panels may be dropped into the lower door panels. Vanity cases and smoking outfits, with ample arm rests and an adjustable footrail give the toursedan all the comforts of a luxurious car.

Colors are special Cole dark blue for the underbody with the superstructure, fenders, running-board shields and radiator in satin black. The front, or driver's compartment, is finished in leather, while the interior of the tonneau is upholstered in plaited gray coach cloth.



Interior of Cole toursedan showing lighting, heating and seating arrangement

New Abbott Line in Four Models



Abbott 1918 sedan, fitted to standard 122-in. wheelbase chassis

THE 1918 line of the Abbott Corp., Cleveland, Ohio, is new throughout. It consists of a chassis assembled from standard parts and four body types, a four-passenger and a seven-passenger touring, which sell for $1,595, and a four-passenger coupe and a five-pasenger sedan, which sell for $2,150. All units are improved.

The engine is the 7N Continental, 3½ by 5¼, with three-point suspension and a unit powerplant. It is block cast and has separately cast waterjacket heads, insuring maximum uniformity in cylinder castings. The pistons are fitted with three diagonally-split concentric expansion rings, and oil grooves are turned on the outside to collect and distribute the oil splash over the inside of the cylinder.

The valve drive is through helically-cut timing gears, each of the timing sets composed of a crank gear, a cam gear and a pump shaft gear, housed at the front end of the engine. The valves are operated by a 1¼-in. camshaft with low carbon steel. The inlet and exhaust valves are interchangeable and have nickel steel heads electrically welded to carbon steel stems. The valves are 1⅛ in. in diameter in clear.

Lubrication is by a combination force-feed and splash system, operated by a horizontal plunger pump driven by an eccentric from the camshaft. This forces the oil through copper tubes directly to the timing gears and all the main crank and camshaft bearings, then drains back into the oil pan to maintain the constant level for the splash system.

The gasoline system is composed of a rear tank from which gasoline feed is taken by the Stewart vacuum system with a type L B Stromberg horizontal, 1¼-in. carbureter. The Stewart vacuum system is placed on the dash in such a fashion that under any condition, on hills or on the level, the float of the carbureter will have sufficient head to secure continuous feed of gasoline.

Starting and lighting is by the double-unit system with starting motor mounted on the left side of the engine to engage with the flywheel by Bendix drive. The distributer is mounted in unit with the generator on the right side of the engine and is driven by pump shaft. The battery is hung from the frame on pressed steel brackets directly ahead of the front seat and can be taken out by lifting the front seat floor board. This is a 6-volt, single wire, ground-return system.

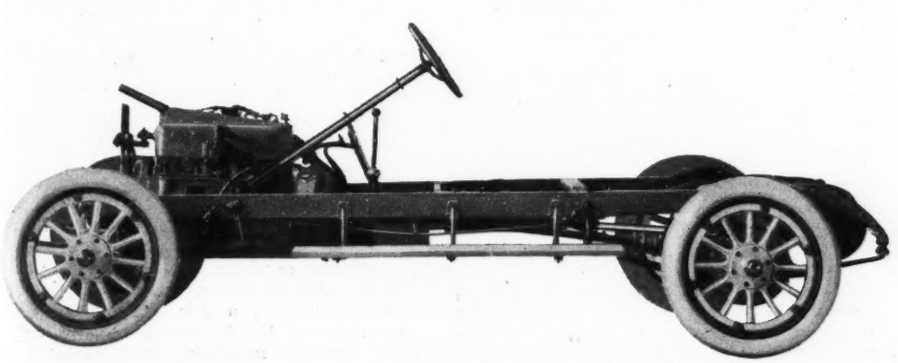
The clutch is a multiple dry-disk type, delivering its drive to a three-speed selective gearbox in which the ratios are as follows: low, 2.8 to 1; intermediate, 1.77 to 1; reverse, 3.6 to 1; high, 1 to 1.

A three-quarter floating rear axle is used, equipped with 1⅜-in. nickel steel shafts for both drive shafts and pinion shafts. The brakes are 14 in. by 2 in., internal and external, with the differential and wheels carried on Hyatt high-duty roller bearings.

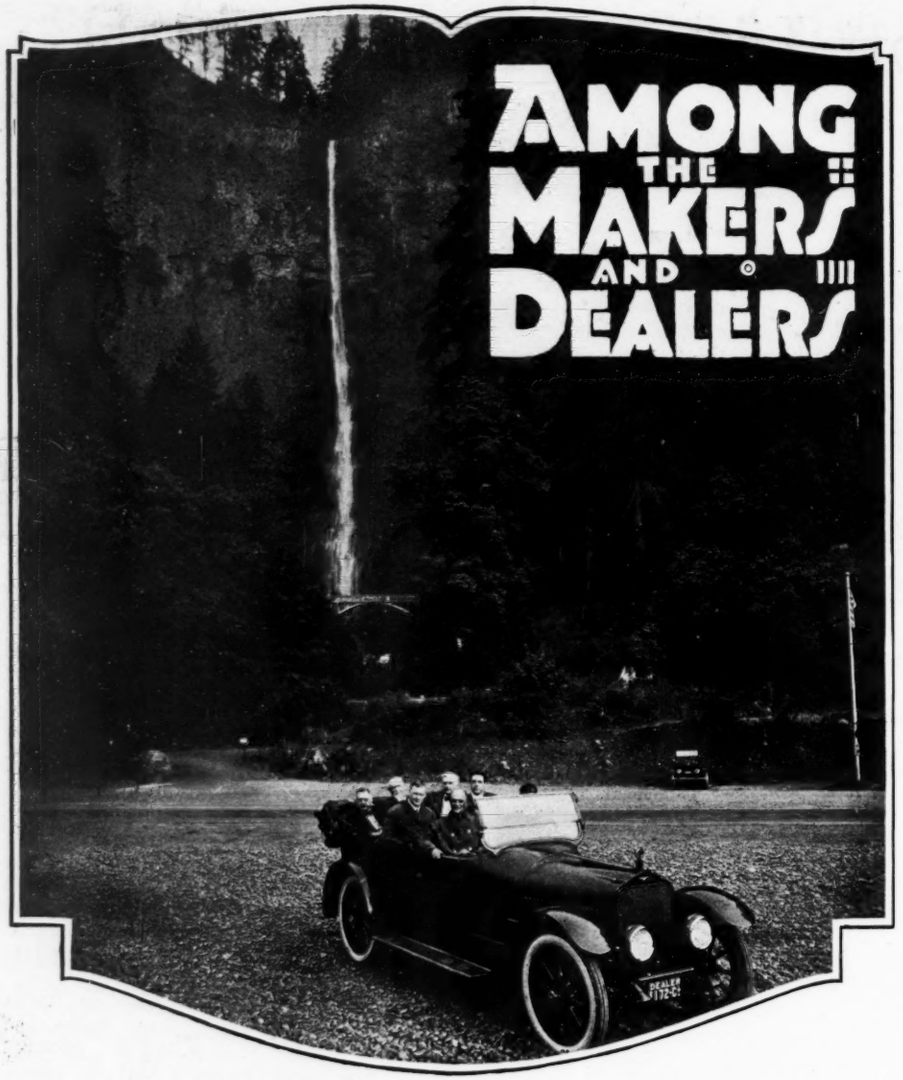
The pinion shaft is carried on Radax bearings directly back of the pinion, and the spring seats on this axle are mounted solid and are so arranged that the pinion shaft under normal load with the chassis level is in straight line with the propeller shaft. The gear ratios in the rear axles for the roadster and speedster are 4.08 to 1 and in the touring car, coupe and sedan, 4.3 to 1.

Semi-elliptic springs are used in both front and rear. The front springs have nine leaves 2 in. wide and are 38 in. long from eye center to eye center. The rear springs have eleven leaves at the front and eight at the rear and are what is known as the Duplex type. The spring dimensions are 2 by 55½ in., and ¾ in. spring bolts are used front and rear. All the spring eyes carry Clemmens steel bushings. The drive is of the Hotchkiss type with both torque and propulsion taken through the springs. The front end of the rear springs takes the torque, part of the load and also the drive.

The wheelbase of the chassis is 122 in.; the frame is 4½ in. pressed steel channel section with kick-up over the rear axle. The side channels are tapered to support the body sill. The wheels are 34 by 4 straight side Firestone rims and tires, with 12-in. spokes in front and rear wheels, each spoke being 1½ in. in diameter. The tire carrier is mounted on the gasoline tank support brackets and contains two malleable iron brackets and a steel rim to carry the auxiliary tire.



Side view of new Abbott chassis for its 1918 line



PORTLAND BRANCH ENTERTAINS SIX GOVERNORS—The chief executives of six states were guests of the White Portland branch during a conference. They appear here on a tour of the Columbia highway and are: Governor Bamberger, Utah; Governor Withycombe, Oregon; Governor Lister, Washington; Governor Stewart, Montana; Governor Boyle, Nevada, and Governor Alexander, Idaho

PIERCE to Manage Federal Truck Sales—F. L. Pierce has been appointed sales manager of the Federal Motor Truck Co. Mr. Pierce formerly was sales manager of the Regal Motor Car Co.

Kapp to Manage Mitchell Advertising—Frank A. Kapp, for several years on the advertising staff of Willys-Overland, Inc., is the new advertising manager of the Mitchell Motors Co., Inc., Racine, Wis.

Agnew Returns to Detroit—W. L. Agnew, formerly director of advertising for the Chalmers Motor Co., is in Detroit after a vacation and soon will announce his new plans for the future.

Moesta Joins Curtiss Company—Marvin W. Moesta, formerly associated with the Continental Motor Co., has joined the Curtiss Aeroplane Co. in the engineering department and will take up his new duties at once.

Oneida Truck Begins Factory—Work has been started on the erection of new plant of the Oneida Motor Truck Co., Green Bay, Wis., which has been manufacturing trucks in leased quarters on a small scale for about six months' time. Recently a 47-acre site was purchased, and the main factory now under construction will be 150 by 476 ft. in size and contain 70,000 sq. ft. of floor space. It will employ between 200 and 250 mechanics.

Kapp to Manage Mitchell Advertising—Frank A. Kapp has been appointed advertising manager of the Mitchell Motors Co. Mr. Kapp was formerly in the advertising department of Willys-Overland, Inc.

Frick Breaks Ground for Plant—Waynesboro, Pa., has broken ground for the building in which is to be manufactured its new gas tractor. The building will be of brick, 60 by 90 ft. and two stories.

1050 Willard Service Stations—The total number of Willard service stations is now in excess of 1050, according to figures received from the company Sept. 13, and this number is being augmented by appointments in states scattered all over the country.

Universal Motor to Double Plant—The Universal Motor Co., Oshkosh, Wis., will double the size of its plant at once to handle contracts recently booked and said to be from the Government. The company has started work on a two-story shop addition, 40 by 165 ft. Upon its completion, the force will be increased to eighty skilled men and the plant will be operated night and day. The owners of the company recently organized the Universal Foundry Co., which has established a plant in Oshkosh and will provide castings for this industry, as well as for other manufacturers in the Fox River valley.

French to Direct Monarch Governor Sales—Williard S. French has been appointed director of sales of the Monarch Governor Corp. Mr. French previously was advertising manager of the Denby Truck Co.

Burress Enters Government Service—Paul D. Burress, factory representative of the Maxwell Motor Sales Corp., has been appointed inspector for the Government and was ordered to report for duty at the Nash Motors Co. at Kenosha.

Coburn Now with Rankin Company—Andrew E. Coburn, formerly advertising manager of the Maxwell Motor Co., has joined the forces of the William H. Rankin Co., and will represent this concern in Detroit and surrounding territory.

McMullen Gets Chevrolet Appointment—B. J. McMullen, who was at one time assistant sales manager of the Chalmers Motor Co., has been appointed district sales manager of the Chevrolet Motor Co. with headquarters at Fort Worth, Tex.

Davis to Add to Factory—The Davis Mfg. Co., Milwaukee, Wis., has awarded contracts for the erection of a new core building, 92 by 100 ft., to supplement the new machine shop and foundry additions now being completed. The Davis company is spending about $200,000 in the enlargement of its plant, which was erected within the last two and a half years.

Cluley Manufactures Motor Accessories—The Cluley Multiplier Co., Green Bay, Wis., has begun production of motor car parts and accessories. The list of new products includes an improved dimmer, headlight reflector, automatic air pump for tire inflation, tire mileage meter, automatic jack and a superheated manifold, all invented and designed by John P. Cluley, manager of the company and inventor of the intricate multiplying device.

Olds Expands to Treble Production—The construction of the two new buildings now has begun production of motor car parts and Lansing, Mich., will enable the company to treble production for the coming year. It will give, for one thing, an assembling line one-third mile long. The facilities will make possible an annual production of 33,000 cars or more. A new system of production will be put into effect, including assembly, the road test of twenty years' precedence, and checking before loading.

Gillette Rubber Co. Expands—The Gillette Rubber Co., Eau Claire, Wis., has reached a stage in the construction and equipment of its new plant where it produces 250 casings and 400 tubes a day. By Dec. 1 the output will have been increased to 1000 tires and tubes daily. The present working force numbers 200, which will be increased to 750 by Feb. 1. The most important work remaining to be completed is a $50,000 boiler house and electric power plant. The company has just increased its capital stock from $1,000,000 to $2,500,000.

Waukesha Shows Earnings of $2,500,000—The Waukesha Motor Co., Waukesha, Wis., did a business during the last year of $2,250,000, a large increase over the previous year. It is predicted that a gain of at least 50 per cent will be shown during the new fiscal year, as the works have been doubled in size and capacity within the last twelve months and at present the output is fifty complete engines a day. The company is capitalized at $1,000,000 and employs 600 or more men, the monthly payroll being in excess of $50,000. Stockholders re-elected all directors, who in turn re-elected officers as

follows: President, C. A. Haertel; vice-president, E. R. Estberg; secretary and general manager, Harry M. Horning; treasurer, S. A. Perkins.

Delling Now with Saxon—E. M. Delling, formerly chief engineer of the Mercer Automobile Co., is chief of inspection for the Saxon Motor Car Corp.

Belding to Make Tractors—A new industry has been formed at Belding, Mich., and will be known as the Belding Machine Co. It has a capital of $25,000 and will manufacture tractors.

Burns with Timken-Detroit—William T. Burns is now tractor engineer for the Timken-Detroit Axle Co. Mr. Burns formerly was associated with Hugo Munsterberg of Harvard University.

Cook Joins Engineering & Sales—E. J. Cook, formerly of the Packard Motor Car Co. and the Allen Motor Car Co., has been placed in charge of the engineering department of the Engineering & Sales Corp., Chicago, and will handle the design of motor trucks and tractors.

Grant Will Add to Plant—The Grant Motor Corp, will erect an addition to its plant at a cost of $750,000. It will be 875 ft. by 60 ft. and four stories high. This addition has been made necessary by the taking over of the Denneen Motor Co., maker of Denmo trucks.

Allen of Liberty in Army Service—G. B. Allen, assistant chief engineer of the Liberty Motor Car Co., has been appointed first lieutenant of the ordnance officers' reserve corps of the United States army, and has been ordered to report for duty at the plant of the Nash Motors Co. as an instructor and inspector in the motor transport department.

Young Bros. Appoints Eastern Office—The Bradford-Ackermann Corp., New York, has been appointed the eastern sales office for Young Bros. Co., Detroit. The sale of Young ovens for japanning and drying will be handled by Bradford-Ackermann for the New England states, New York, New Jersey, Maryland, Delaware and Eastern Pennsylvania.

Re-adjustment of Crude Rates Sought—The Northeastern Ohio Rubber Shippers' Association, recently formed, does not plan any extended campaigns for rate reductions at present and will operate on defensive basis rather than offensive. The association now is handling a case before the Interstate Commerce Commission seeking re-adjustment on rates on crude rubber, which were increased unjustifiably, according to the association, by carriers in March, 1910, following culmination of a controversy extending over a seven-and-a-half year period.

Cleveland Plow to Build—The Cleveland Motor Plow Co., East Cleveland, will build a plant costing $300,000.

Studebaker Opens Branch at Dubuque—The Studebaker Corp. has opened a factory branch at Dubuque, Iowa, with Ross B. Henwood of Chicago as manager.

Von Rosen Resigns From Saxon—E. E. Von Rosen has resigned as treasurer and director of the Saxon Motor Car Corp. No announcement has yet been made of Mr. Von Rosen's future plans.

Sweet Takes Vacation from Engineering—Ernest Sweet, who resigned recently from the engineering department of the Cadillac Motor Co., is taking a vacation on his Michigan farm and will announce his new connections later.

Cutler-Hammer Completes First New Unit—The Cutler-Hammer Mfg. Co., Milwaukee, is completing the first unit of the reconstruction of its plant. The units are seven stories high, 50 by 200 ft., and each will cost approximately $250,000. The reconstruction of the plant is being done without interfering with the operation of the present plant, units of which are moved as rapidly as new structures are completed.

Liston Sails for Honolulu—J. H. Liston, sales manager of the Perfection Heater Co., sailed last week for Honolulu, on a six-week business and pleasure trip.

Portage Rubber Co. Opens Branch—The Portage Rubber Co., Akron, Ohio, has opened a branch in Minneapolis, Minn. L. T. Ware is manager.

DeLancey to Manage Empire Branch—W. H. DeLancey has been appointed manager of the Empire Rubber & Tire Co. branch in Kansas City, Mo.

McCord Earns 110 Per Cent—The McCord Mfg. Co.'s net earnings for the first seven months of the fiscal year were at the rate of $840,000 for the entire year, or a ratio of 110 per cent on the perferred stock.

Lemmon to Manage Sterling Advertising—John H. Lemmon has been appointed advertising manager of the Sterling Motor Truck Co., Milwaukee, Wis. He has been with the Nichols-Finn Advertising Co.

Landovers Production to Begin Soon—The Landover Truck Co., Menominee, Mich., is completing the repairs and machinery installation in its factory here and will commence production soon. The company plans to sell $500,000 worth of stock.

United Motors Service Branch Opens—The United Motors Service, Inc., sole and official representative of the Delco, Klaxon and Remy companies, has opened a San Francisco branch with H. J. Galvin, formerly San Francisco manager for Remy, in charge. Other branches will be opened soon.

Gear Makers Meet at Chicago—The American Gear Manufacturers' Association held its semi-annual session in Chicago and will meet again in May at Pittsburgh. Papers on various phases of gears were read and discussed. A motor trip through the park system and a dinner were part of the program.

Gibson-Hollister Moves Its Plant—The Gibson-Hollister Mfg. Co. has moved from Boston to its new plant at Springfield, Mass. The plant doubles production and provides for future expansion. At present the entire new plant will be devoted to the mnaufacture of Jumbo spark plugs in the new non-rustable Noncoro finish and a special aviation type spark plug.

American Auto Body to Build—The American Auto Body Co. of Milwaukee, which was incorporated recently with $50,000 capital to manufacture passenger and commercial car bodies, winter tops, etc., is preparing to build a complete manufacturing unit in Milwaukee this fall. Plans contemplate a fireproof building, 200 by 300 ft., in size.

Westinghouse Gets Generator Contracts—The Locomobile, Pierce-Arrow and Garford companies have contracted with the Westinghouse Electric & Mfg. Co., for electric generators for their 1918 truck output. The generator, which was designed to meet specifications of the Government for military truck service, also will be installed on the 1918 Mercer.

Ford Reduces Sociological Staff—The Ford Motor Co. advisory staff of the sociological department has been reduced from 150 to fifty men, but Henry Ford says this is not due to a change in profit-sharing but because of increased efficiency of the department. Seven thousand of the employees have been found so satisfactory that they are on the honor roll and no longer are visited by investigators. Mr. Ford has 17,000 workers of draft age, only 1200 of whom it is believed will not be exempt.

Coming Motor Events

CONTESTS

Sept.	28—Trenton, N. J., track race.
*Sept.	29—New York speedway race, championship.
Oct.	6—Danbury, Conn., track race.
Oct.	6—Uniontown, Pa., speedway race.
*Oct.	13—Chicago speedway race, championship.
Oct.	15—Richmond, Va., track race.
Oct.	27—New York speedway race.

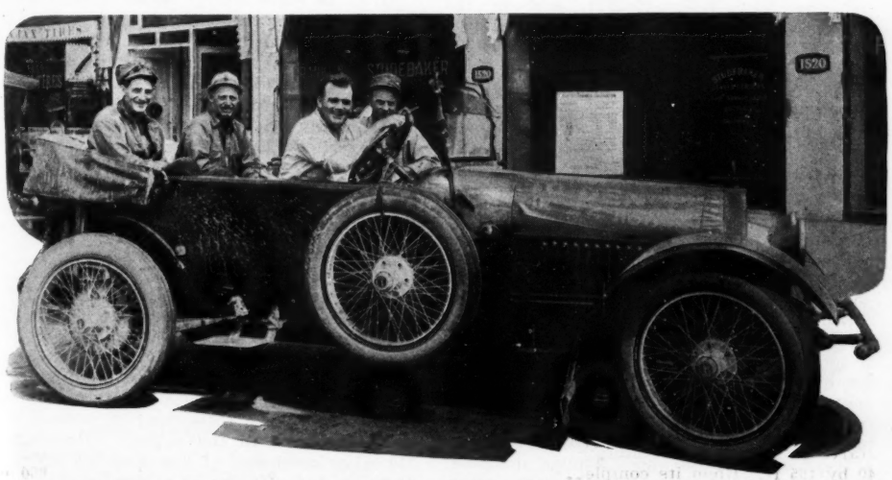
*A. A. A. championship award event.

MEETINGS

Oct.	9-11—Pittsburgh, Pa., National Association of Purchasing Agents, annual congress.

SHOWS

Sept.	22-29—Chicago, Ford accessories.
Oct.	1-6—Buffalo, N. Y., closed cars.
Oct.	6-13—Boston.
Oct.	6-13—Cincinnati, Ohio.
Oct.	8-13—St. Louis.
Oct.	9-12—Toledo, Ohio.
Oct.	13-28—Dallas, Tex., state fair.
Nov.	12-18—Denver.
Jan.	5-12—New York.
Jan.	19-26—Montreal, Canada.
Jan.	26-Feb. 2—Chicago.
March	2-9—Boston.



FROM KANSAS TO DENVER IN 24 HOURS—Fred Etchen of the Studebaker Agency at Coffeeville, Kan., in the car which made the run from Coffeeville to Denver in 23 hr. 29 min. Incidentally he won a $1,000 wager by making the run

From the Four Winds

WITH ROOT IN RUSSIA—Elihu Root, head of the diplomatic mission to Russia, leaving an Overland to go into conference with the new Russian cabinet. This picture was taken in front of the Zemstro Union at Moscow and was brought back by a member of the mission of which Mr. Root was head

OREGON'S Registration Score 1 to 22—Figures recently compiled by the Dealers' Motor Car Association of Oregon show that 1691 new licenses were issued in Oregon during August and that 1320 of this number represented cars of 1917 model. Up to date, a total of 46,000 cars have been registered in Oregon this year, giving the state one car to each twenty-two persons.

Briscoe Makes Economy Run—An economy run is being made in a stock Briscoe over the Dixie highway from Jackson, Mich., to St. Augustine, Fla. The object is to make the trip on 50 gal. of gasoline, and the pilot, Charles F. Hopkins, Jr., is the oldest Briscoe dealer. The distance is more than 1300 miles, and no special attachment is used, it is claimed.

S. P. C. for Motor Car Tires—A Canadian who appreciates the cost of rubber has invented a sunshade for the tires on the car when it is standing still. This sun shade instantly rolls around each tire when the driver presses a lever. When the car is ready to start again the sunshade rolls into its place in the compartment above the wheel and under the fender. Its operation is similar to that of the ordinary window shade, and just as speedy.

Missouri Pushes Road-Building Work—An extensive campaign of road building in Missouri is being stimulated by the governor, the National Old Trails' Road Association and other bodies. The governor is urging county courts to co-operate by taking advantage of the state's offer to supply its 500 convicts for road work at $1.25 a day. Montgomery County is the first county in the state to take advantage of this offer; it will use convicts to help improve the National Old Trails Road through the Mineola Hills. The National Old Trails' Road Association, met at Columbia, Mo., Friday, Sept. 21, to urge the movement for improving this road across the state.

M. & A. M. Sanctions Boston—The Motor and Accessory Manufacturers body has placed its stamp of approval on the Boston motor car and accessory show, March 2 to 9. It now remains for the National Automobile Chamber of Commerce to place the show on an entirely national footing, when it will be wholly on a par with the other two national shows.

Drive Cross-Country a Memorable One—Major George W. Brownyard, veteran of the Philippines and the Boxer rebellion, is driving the first Willys-Knight, sold in the Rochester territory, in his trip from Rochester, N. Y., to San Francisco to join his battery. The engine already has run 21,000 miles and is said to be in perfect condition. At Denver Major Brownyard's father, who is with him on the trip, met his brother for the first time in seventy-eight years. Sixty-two years ago the brother left Rochester, driving a pair of mules. It took a motor car to unite them.

Hauling Road Gravel by Tractors—Records of the cost of hauling gravel for some main roads in Minnesota show that it cost from 57 to 94 cents a mile for loading and hauling a cubic yard of gravel up to a half mile, from 30 to 48 cents where the hauling was from a half to a mile and from 23 to 35 cents where it was from 1 to 1½ miles. The tractor outfit, consisting of a gasoline creeping tractor, seven 3½-yd. spreading wagons, a 50-yd. storage bin and a loading machine, did the work under greater odds at an average cost of 15.4 cents a cubic yard a mile for the first part and 15.41 cents the latter part. With a more powerful tractor and a loading outfit of greater capacity the engineer estimated the work could be done at a much lower cost.

Bloomington Directs Jaywalkers—Bloomington, Ind., has marked its streets to guide all would-be jaywalkers in the straight and narrow path. If the jaywalker goes in the wrong direction he sees before him in large white letters on the street pavement, "Stop." If he hesitates as to which way to go he sees in the right crossing path the word "Walk." The system has been found very effective by the Bloomington Motor Club.

Car Thefts in Ohio Decrease—Since the launching of the state-wide drive against car thefts in Ohio, July 20, when club representatives, chiefs of police and municipal judges met in Columbus, the number of thefts of motor cars has fallen off 50 per cent, according to the announcement of the state motor car registrar. A new system of registration is being installed by which owners will get the same license numbers permanently or as long as they own machines.

Meets Some Bad Roads Out West—J. W. Johnson, a road engineer, who has been laying out new roads and charting trails between Salt Lake City and San Francsico, reports some bad roads and stiff grades in his scout motoring. Hardly a mile of the trip through the mountain section of Nevada and Placer counties did his car ride on an even keel. In El Dorado County swollen streams blocked his passage and at times, he says, his Kissel resembled a boat more than a car.

Thieves Try to Take U. S. Cars—Car thefts in Washington continue so numerous that the superintendent of police has detailed a special squad for detection of the thefts. Two attempts have been made recently to steal new machines purchased for the use of the Signal Corps of the Army. In one instance the thieves tore down a brick garage in an effort to get away. They evidently were injured in the attempted getaway, as they abandoned the car and fled, leaving a trail of blood. The car was badly damaged.

D. C. to Have Better Roads—The District of Columbia is to spend $500,000 within the next year in the improvement of the streets of Washington and its suburbs. Work on improvements has begun. Washington and suburbs, comprising the District of Columbia, already have streets and roads which are excellent as compared with those in other cities and suburbs of the country, but the heavy travel over them has made necessary improvements. Money with which to make the improvements was appropriated recently by Congress.

Prizes for Long-Distance Fair Motorists—Cash prizes for long distance automobile travel to the Minnesota State Fair this month are being distributed. The first, $50, went to Mr. and Mrs. J. W. Nevills, Brawley, Cal. The second went to Mr. and Mrs. Eugene Cox, Los Angeles. Actual distance between the Twin Cities and starting points was considered in the contest. Brawley is 150 miles southeast of Los Angeles, and the distance traveled by the Nevills was 5981 miles. Ten other contestants registered from Boston to Seattle.